

Cancer Prevention



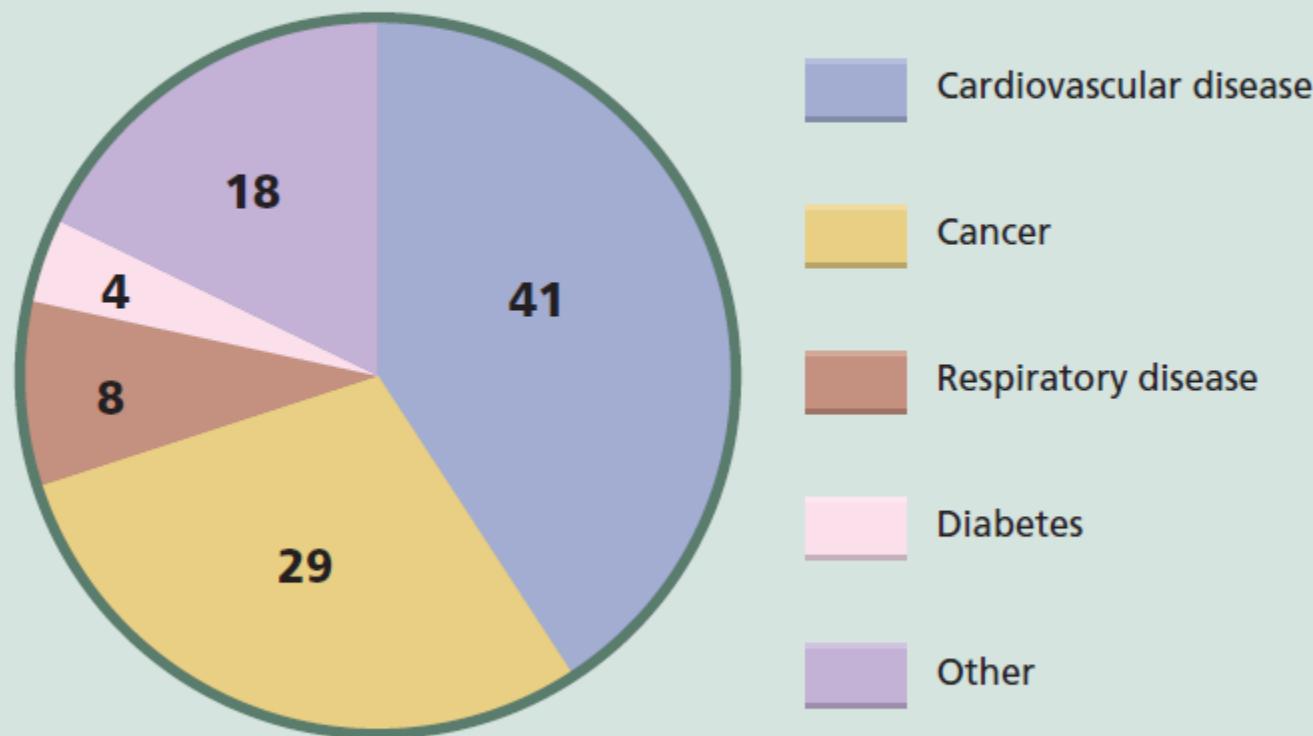
Cancer Prevention

- ◆ Cancer is a group of diseases characterized by uncontrolled, disorderly cell growth
- ◆ Cancer is the second-leading cause of death in the U.S. and the leading cause for young adults and children
- ◆ One in four Americans will eventually develop one or more of the more than 100 different forms of cancer

Non-communicable causes of death

USA

Per cent of deaths



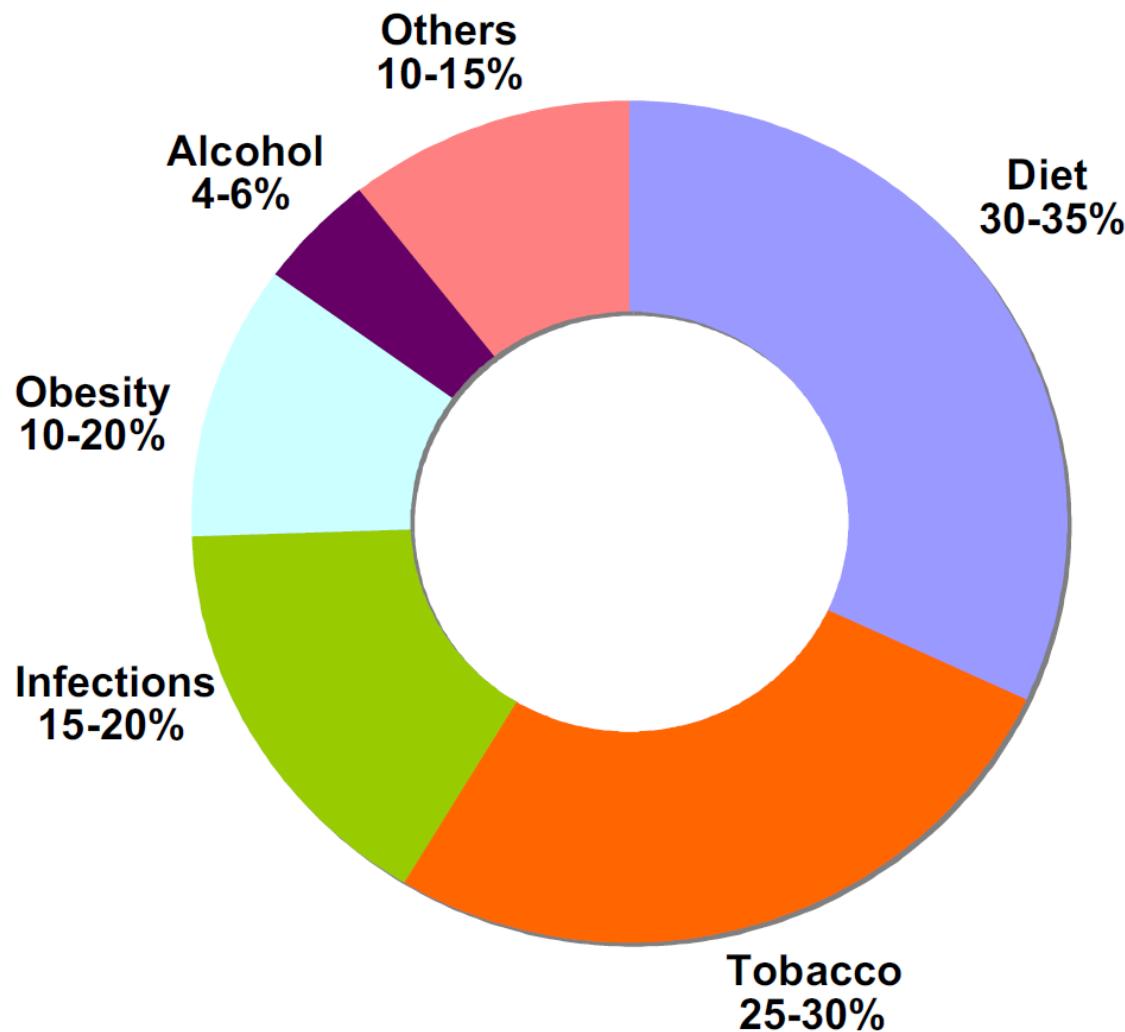
Data from World Health Organization⁴⁶

World
Cancer
Research Fund



American
Institute for
Cancer Research

Causes of Cancer



Seven Danger Signs of Cancer

C – Change in bladder or bowel habits

A – A sore that doesn't heal

U – Unusual bleeding or discharge

T – Thickening or lump in the breast or other area

I – Indigestion or difficulty swallowing

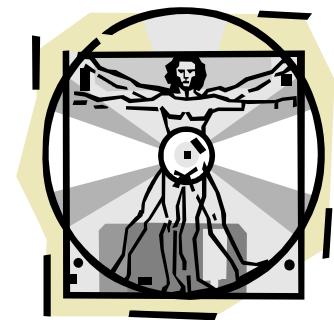
O – Obvious change in a wart or mole

N – Nagging cough or hoarseness



Cancer Sites

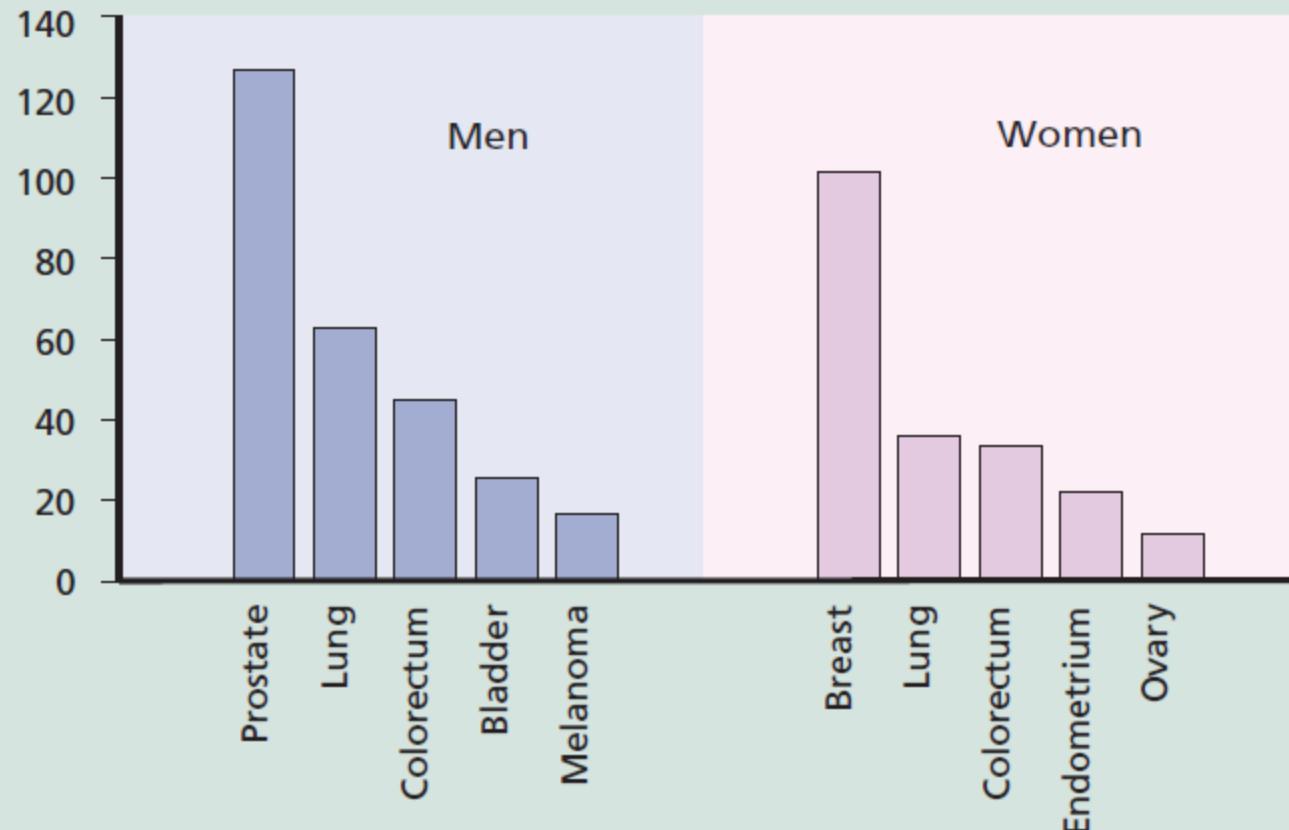
- ◆ Skin cancer is the most common cancer (incidence)
- ◆ Lung cancer is responsible for the most deaths (mortality) in both men and women
- ◆ Breast cancer is the most common cancer among women
(incidence not mortality)
- ◆ Prostate cancer is the leading cancer diagnosis among men
(incidence not mortality)



Age-standardised rates of common cancers

USA

Age-standardised rate per 100 000



Data from International Agency for Research on Cancer²⁰

Cancer Incidence

Ten Leading Cancer Types for Estimated New Cancer Cases, by Sex, United States, 2016
*Excludes basal and squamous cell skin cancers and in situ carcinoma except urinary bladder.

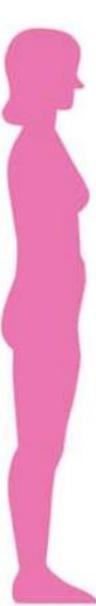
Estimated New Cases

		Males	Females		
Prostate	180,890	21%		Breast	246,660 29%
Lung & bronchus	117,920	14%		Lung & bronchus	106,470 13%
Colon & rectum	70,820	8%		Colon & rectum	63,670 8%
Urinary bladder	58,950	7%		Uterine corpus	60,050 7%
Melanoma of the skin	46,870	6%		Thyroid	49,350 6%
Non-Hodgkin lymphoma	40,170	5%		Non-Hodgkin lymphoma	32,410 4%
Kidney & renal pelvis	39,650	5%		Melanoma of the skin	29,510 3%
Oral cavity & pharynx	34,780	4%		Leukemia	26,050 3%
Leukemia	34,090	4%		Pancreas	25,400 3%
Liver & intrahepatic bile duct	28,410	3%		Kidney & renal pelvis	23,050 3%
All Sites	841,390	100%		All Sites	843,820 100%

Cancer Mortality

Ten Leading Cancer Types for Estimated Deaths, by Sex, United States, 2016

Estimated Deaths

			Males	Females		
Lung & bronchus	85,920	27%		Lung & bronchus	72,160	26%
Prostate	26,120	8%		Breast	40,450	14%
Colon & rectum	26,020	8%		Colon & rectum	23,170	8%
Pancreas	21,450	7%		Pancreas	20,330	7%
Liver & intrahepatic bile duct	18,280	6%		Ovary	14,240	5%
Leukemia	14,130	4%		Uterine corpus	10,470	4%
Esophagus	12,720	4%		Leukemia	10,270	4%
Urinary bladder	11,820	4%		Liver & intrahepatic bile duct	8,890	3%
Non-Hodgkin lymphoma	11,520	4%		Non-Hodgkin lymphoma	8,630	3%
Brain & other nervous system	9,440	3%		Brain & other nervous system	6,610	2%
All Sites	314,290	100%		All Sites	281,400	100%

Exercise and Cancer Prevention

- ◆ If people exercised, maintained a healthy weight, and followed a proper diet, 30% to 40% of all cancers could be prevented
- ◆ People who sit or are inactive most of the time have a 30% to 100% greater chance of contracting colon cancer
- ◆ Premenopausal women can reduce the risk of cancer 50% to 72% by exercising



Cancers of Concern to Everyone

- ◆ Lung cancer is the leading cause of cancer death around the world
- ◆ Cancers of the colon and rectum (colorectal cancer) ranks third in cancer deaths for men and women
 - The cure rate for colorectal cancer is only 10% once it has spread
 - Diet is considered the primary cause of colorectal cancer

Types of Cancer

- ◆ Carcinoma – Usually occurs in rapidly dividing tissues that cover or line our bodies, such as skin, colon, breast, liver, and lung
- ◆ Sarcoma – Generally occurs in more slowly dividing tissue, such as bones, muscle, and other connective tissue
- ◆ Leukemia – Cancer of blood-forming tissue, such as bone marrow and the spleen

Stomach, Liver, and Pancreatic Cancer

- ◆ Stomach cancer is steadily declining in the U.S., probably because of refrigeration and decreased use of salt as a preservative
- ◆ Liver cancer is very deadly; in the U.S. it is most closely linked to hepatitis and cirrhosis
- ◆ Pancreatic cancer is one of the five leading causes of cancer death, but relatively little is known about it

Leukemia and Lymphoma

- ◆ The causes of leukemia are largely unidentified; in adults, progression of the disease is slow and produces few symptoms
- ◆ Lymphoma is cancer of lymphoid tissue
- ◆ Hodgkin's disease rates have declined, especially among the elderly
- ◆ Non-Hodgkin's lymphoma rates have nearly doubled since the 1970s



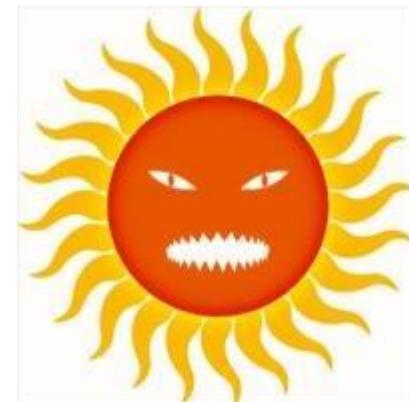
Skin Cancer

- ◆ Basal cell carcinoma is the most common skin cancer, but it grows slowly and rarely spreads
- ◆ Squamous cell carcinoma is the second most common skin cancer; it also grows slowly, but it does metastasize
- ◆ Malignant melanoma is the least common skin cancer, but it causes of 75% of skin cancer deaths

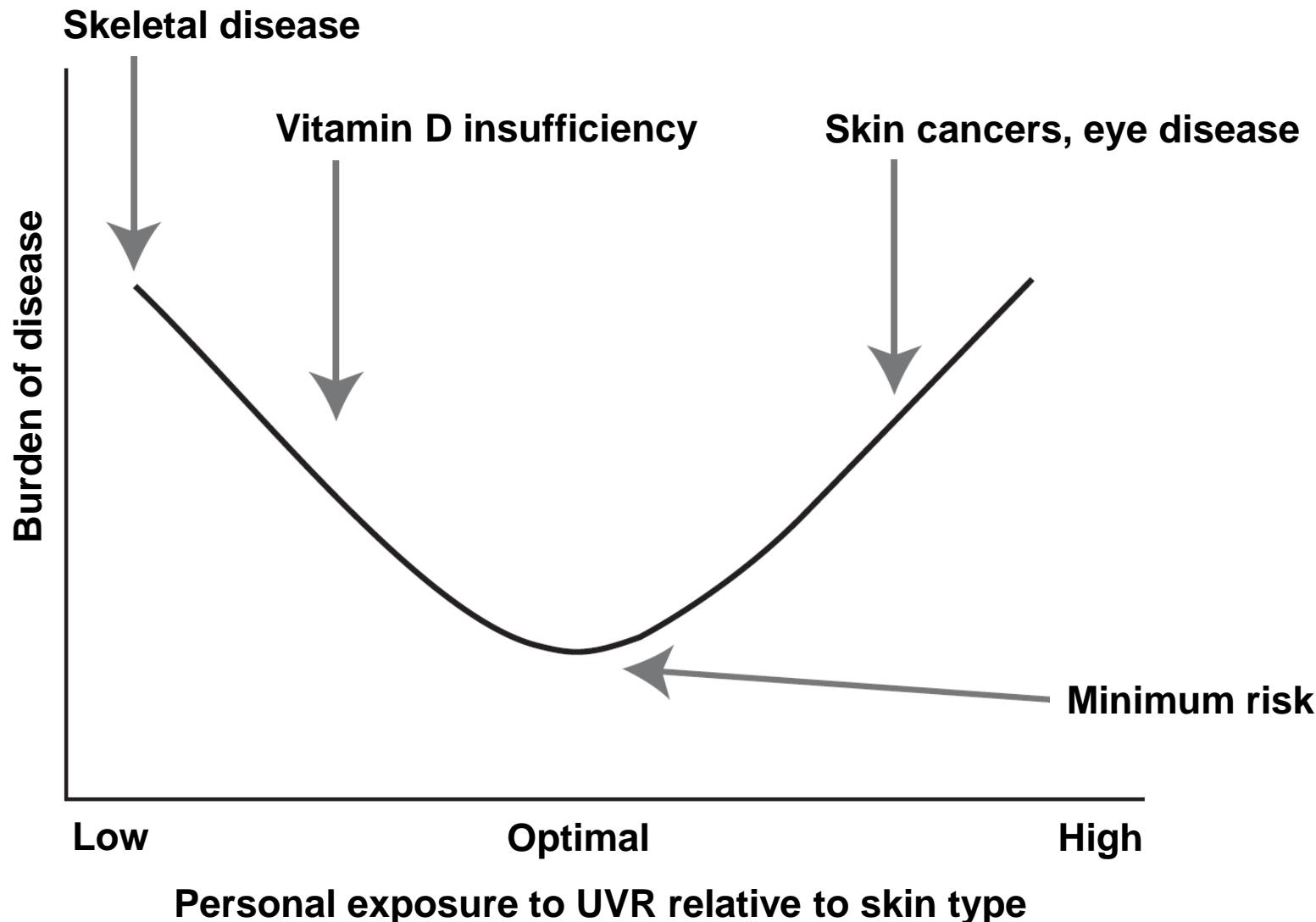


Skin Cancer

- ◆ Incidence of melanoma seems to be related to intermittent sun exposure and blistering sunburns early in life
- ◆ Melanoma often appears on parts of the body rarely exposed to the sun; use of sunscreen does not seem to decrease risk
- ◆ Melanoma incidence has increased dramatically in the last few decades

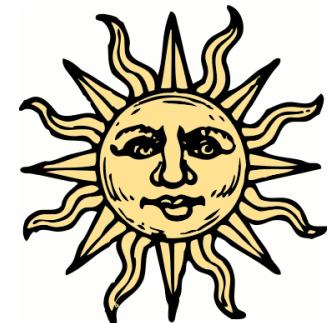


Ultraviolet Radiation and Health: Friend and Foe



In Defense of the Sun

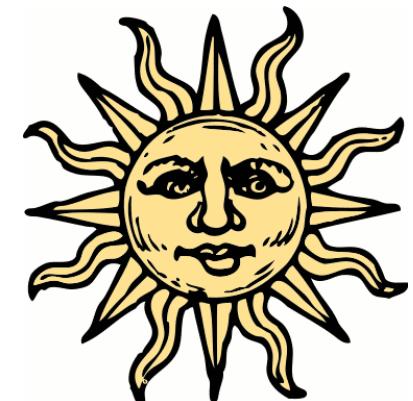
“Emerging scientific evidence strongly supports the beneficial role of vitamin D in reducing the risk of incidence and death from many chronic and infectious diseases.”



“Although more research is required to evaluate the findings in this study, the message that UVR should be avoided is counterproductive.”

Avoiding the Sun is a Health Risk

- ◆ The excess mortality rate amongst those who avoid sun exposure was mainly due to an increased risk of death due to CVD and noncancer/non-CVD.
- ◆ The increased life expectancy of women with active sun exposure habits will increase the proportion of cancer deaths.



Skin Cancer

Knowing the ABCD's of skin cancer can help you detect melanoma in the early, treatable stages

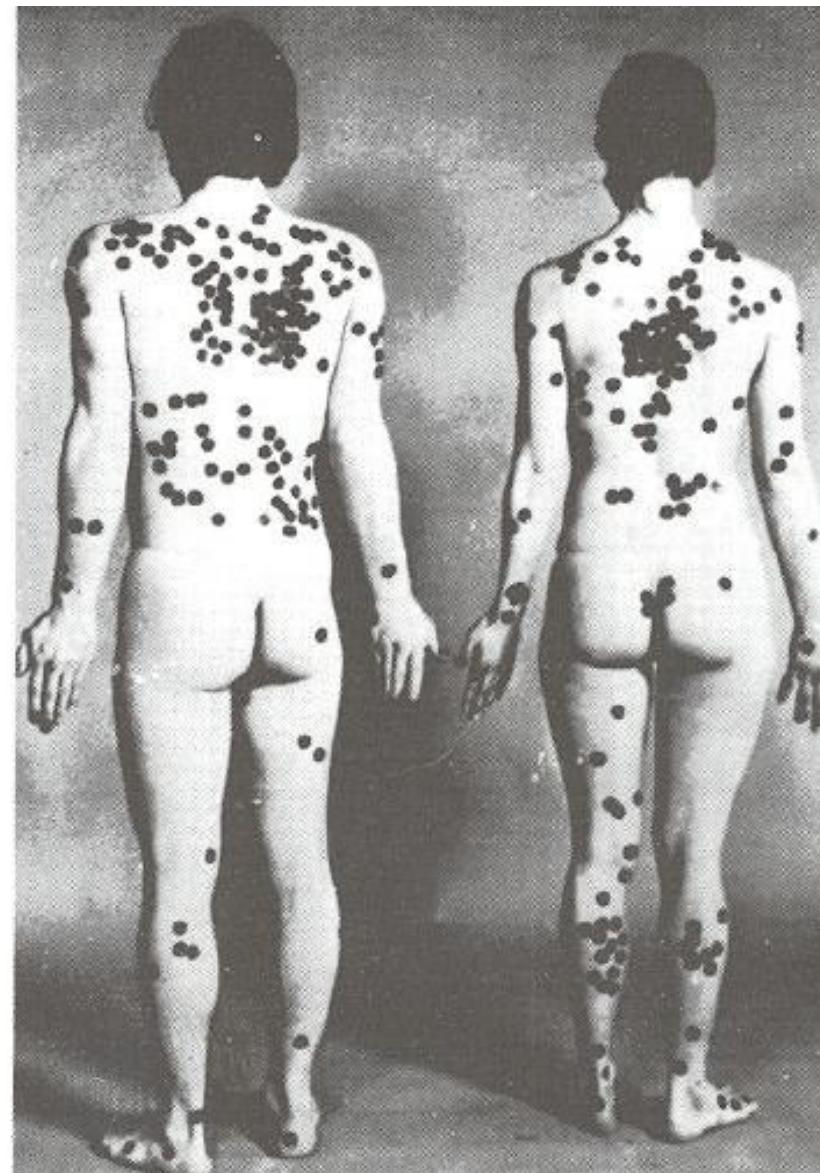
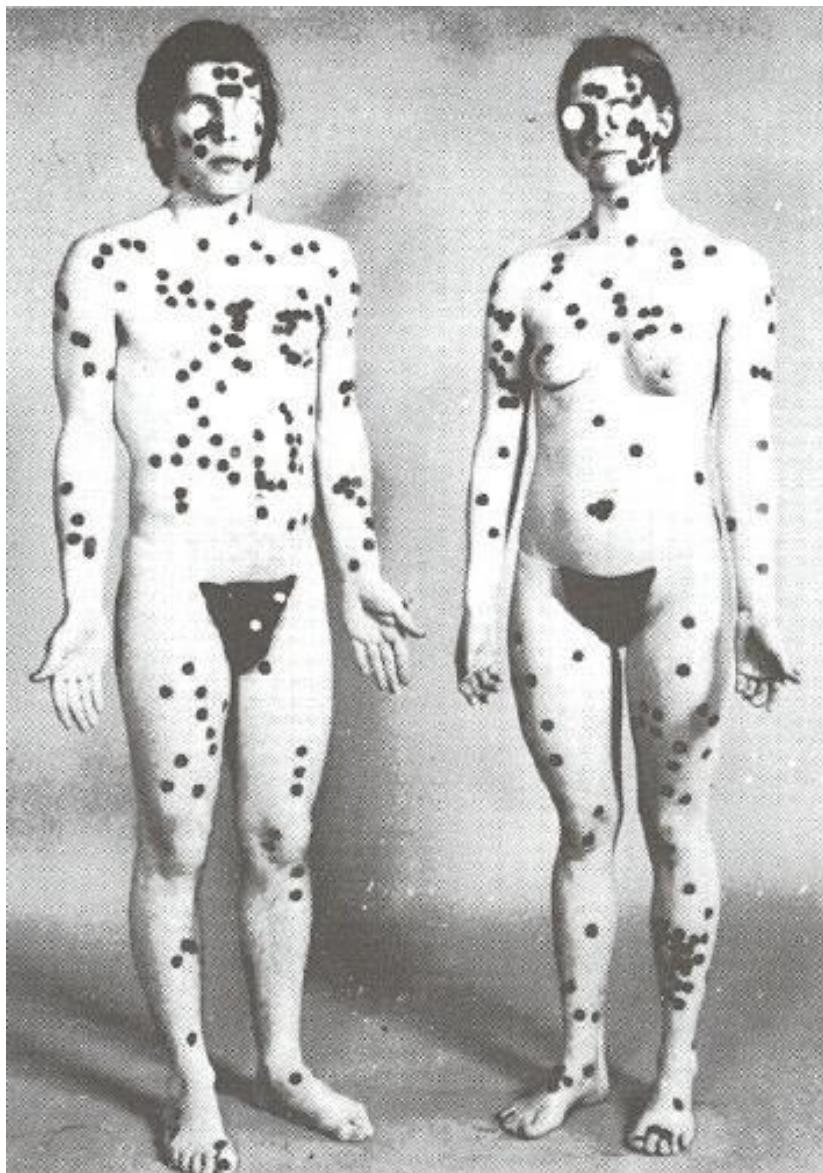
A = Asymmetry (halves are shaped differently)

B = Border irregularity (may have scalloped or uneven edges)

C = Color (color is not uniform)

D = Diameter (larger than 6 mm)





Location of malignant melanoma lesions in 731 patients

Breast Cancer

- ◆ One in nine women who live to age 85 will develop breast cancer
- ◆ Localized breast cancers have a 97% 5-year survival rate
- ◆ Monthly breast self-exams are the best way to detect breast cancer
- ◆ Non-genetic factors are responsible for 90% of breast cancers

Breast Feeding & Breast Cancer

“Human milk is the natural, complete food for infants until around 6 months of age. There is no completely adequate substitute.”

“Within the remit of this Report, the strongest evidence, corresponding to the judgement of ‘convincing’, shows that lactation – breastfeeding by the mother – protects her against breast cancer at all ages thereafter.”

Breasts Soak Up Toxins



<http://www.youtube.com/watch?v=ReAa107ir2c&hd=1>

Summary of Recommendations

Population	Recommendation	Grade
Women, Age 50-74 Years	The USPSTF recommends biennial screening mammography for women 50-74 years.	B
Women, Before the Age of 50 Years	The decision to start regular, biennial screening mammography before the age of 50 years should be an individual one and take patient context into account, including the patient's values regarding specific benefits and harms.	C
All Women	The USPSTF recommends against <i>teaching</i> breast self-examination (BSE).	D

Clinical Practice Guidelines from the American College of Physicians



The American College of Physicians (ACP) found no evidence that routine pelvic examination in asymptomatic, nonpregnant, adult women provides any benefit. With the current evidence, we conclude that performing pelvic examination exposes women to unnecessary and avoidable harms with no benefit.



<https://www.youtube.com/watch?v=enY3-PrLMiw>

Other Cancers Affecting Women

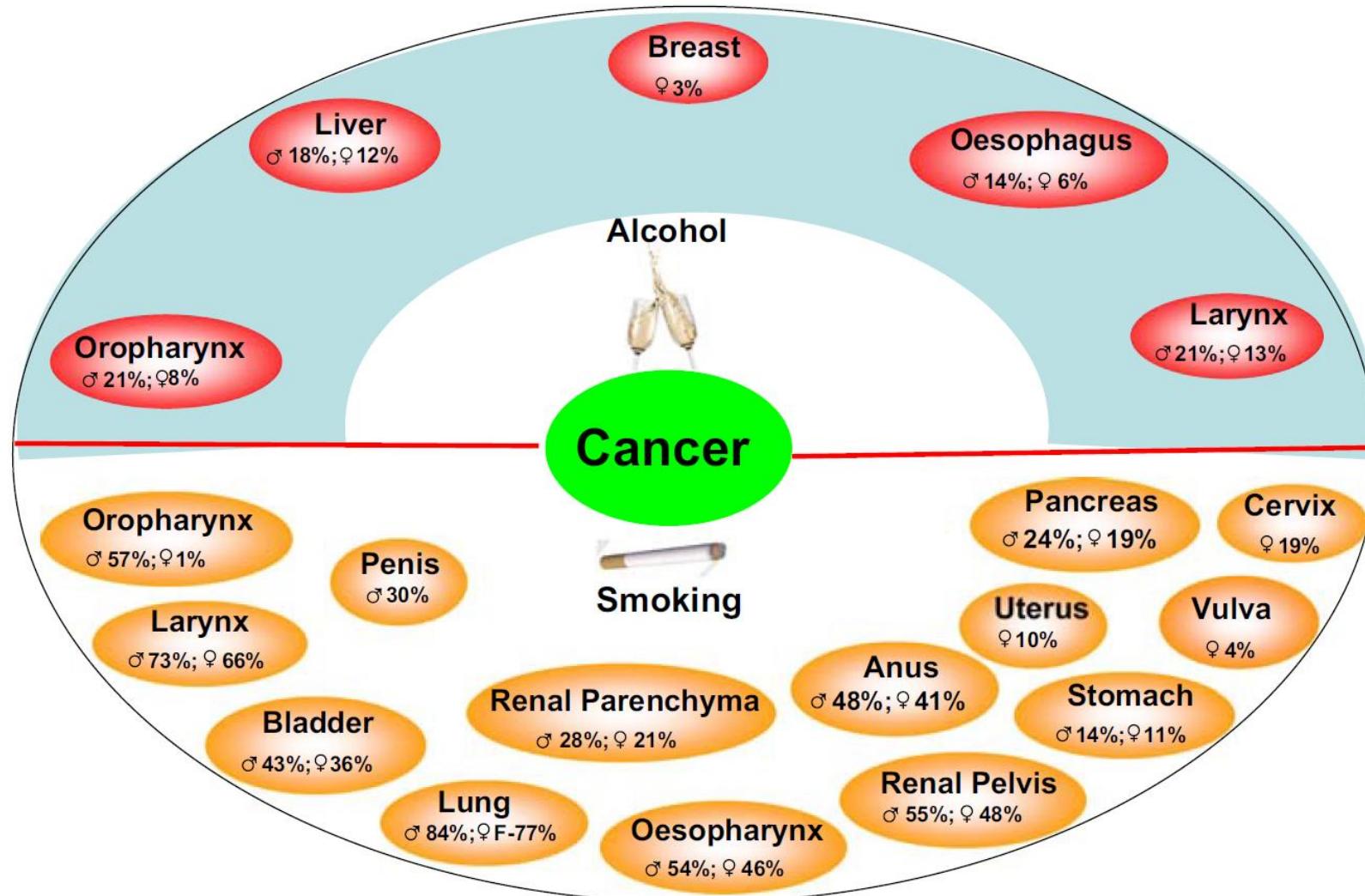
- ◆ Uterine cancer occurs in either the cervix or the endometrium
- ◆ Cervical cancer is one of the most treatable forms of cancer
- ◆ Ovarian cancer is often deadly because it is rarely found in the early stages



Cancers Affecting Men

- ◆ Five thousand 15–34 year old men are diagnosed with testicular cancer every year
- ◆ Young men should perform a monthly testicular self-exam
- ◆ Prostate cancer rarely strikes young men
- ◆ Although prostate cancer is the second leading cause of cancer death in men, with early diagnosis the cure rate is almost 100%

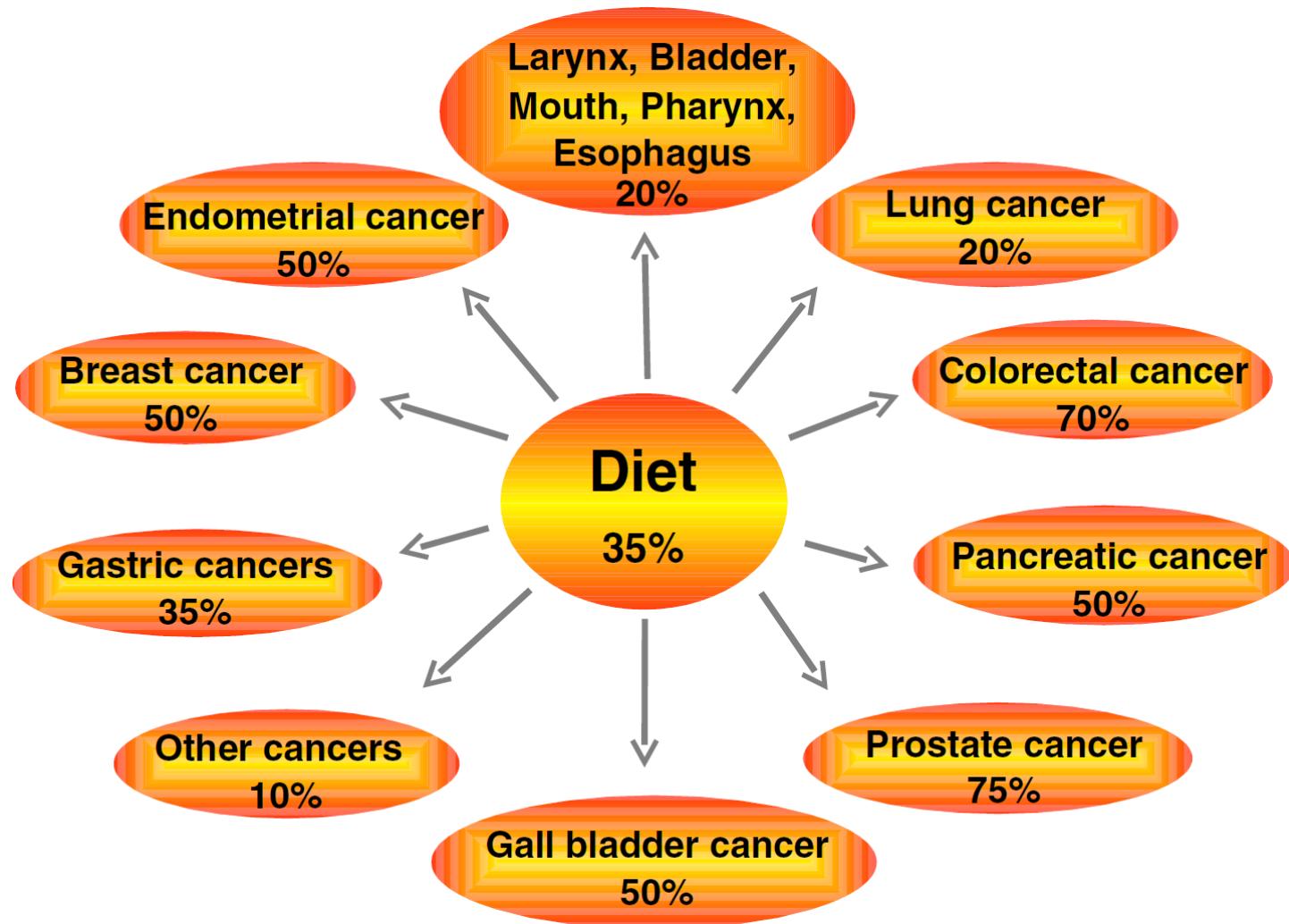
Cancers Linked to Smoking and Alcohol



According to the National Academy of Sciences, 60% of all cancers in women and 40% of all cancers in men may be due to dietary and nutritional factors.



Cancer Deaths Linked to Diet

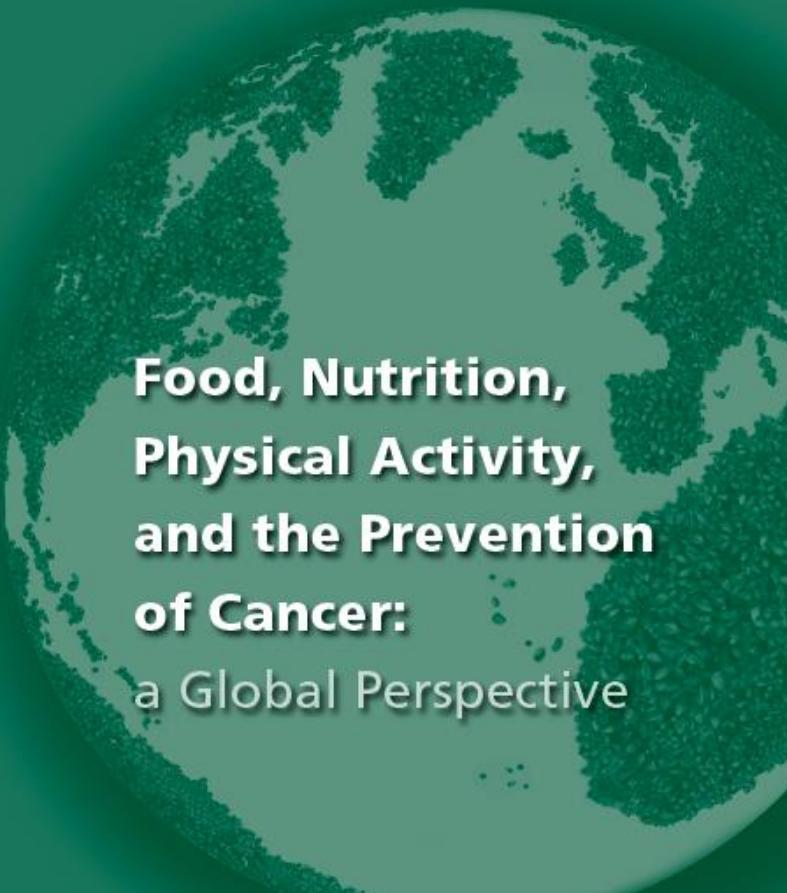




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Cancer Research



**Food, Nutrition,
Physical Activity,
and the Prevention
of Cancer:**

a Global Perspective

RECOMMENDATION 1

BODY FATNESS

**Be as lean as possible within
the normal range¹ of body weight**

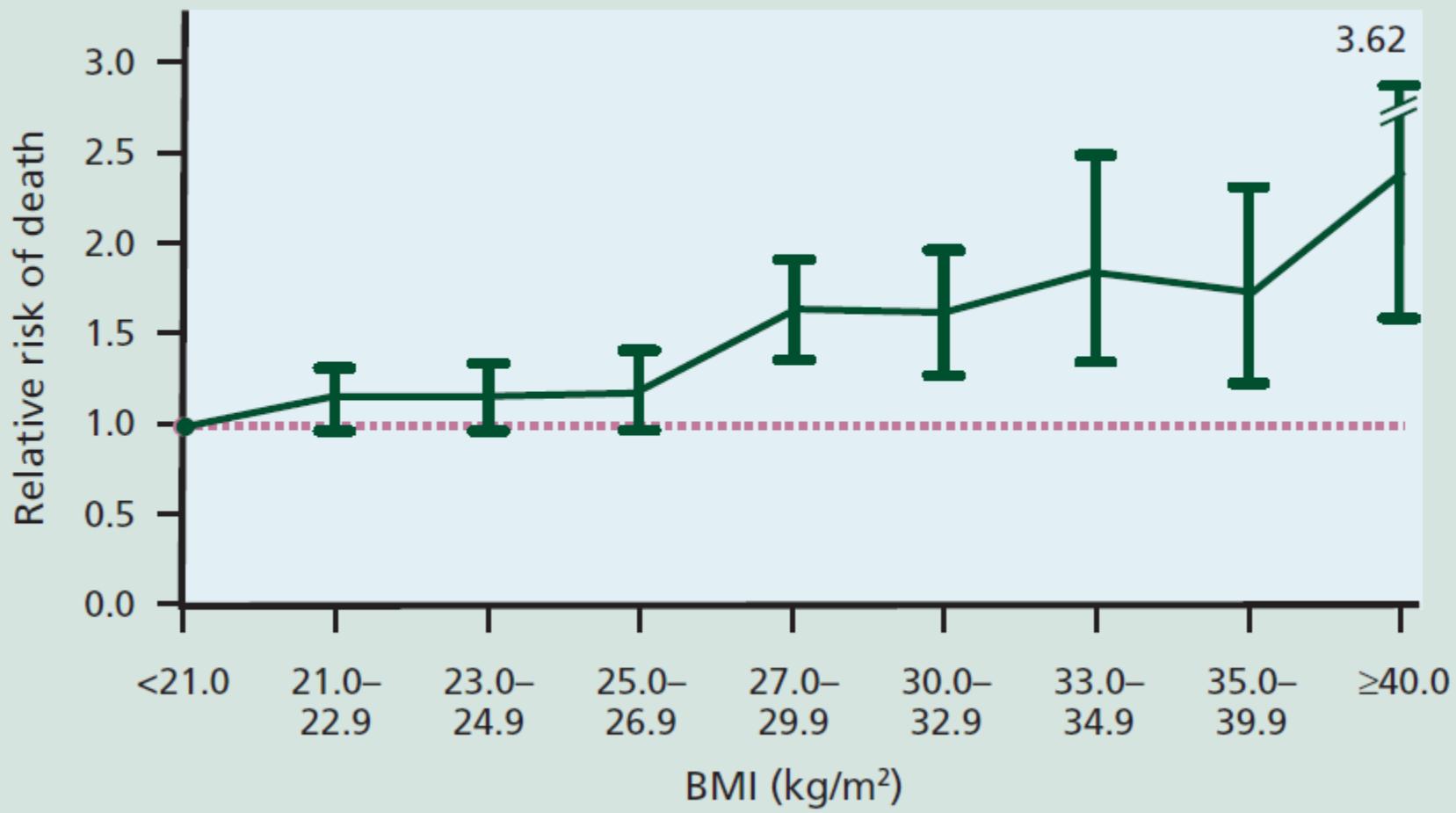
PERSONAL RECOMMENDATIONS

Ensure that body weight through childhood and adolescent growth projects towards the lower end of the normal BMI range at age 21

Maintain body weight within the normal range from age 21

Avoid weight gain and increases in waist circumference throughout adulthood

Death from cancer (1740 cases)



Fat intake, especially animal fat, is one of the key factors consistently implicated in higher cancer rates.

The cancers most closely associated with high fat intake include breast, colon, rectum, uterus, prostate, and kidney. Partially hydrogenated vegetable oils, commonly found in processed foods, are considered a major contributor to the carcinogenic effect of fats.

This so-called affluent diet is high in fat,
which can more readily concentrate such
chemicals as pesticides, preservatives,
and industrial pollutants.

All fried and broiled foods contain
mutagens, chemicals that can damage
cellular reproductive material, but fried
and broiled meats have far more mutagens
than similarly prepared plant foods.

RECOMMENDATION 2

PHYSICAL ACTIVITY

Be physically active as part of everyday life

PERSONAL RECOMMENDATIONS

Be moderately physically active, equivalent to brisk walking, for at least 30 minutes every day

As fitness improves, aim for 60 minutes or more of moderate, or for 30 minutes or more of vigorous, physical activity every day

Limit sedentary habits such as watching television

Box 5.2

Sedentary ways of life

The evidence judged in this chapter shows that higher rather than lower levels of physical activity protect, or may protect, against a number of cancers. Most studies of physical activity are carried out in high-income countries with low average levels of occupational, household, and transport physical activity (characterised as sedentary ways of life).

What are now regarded as high levels of physical activity in urbanised and industrialised settings correspond roughly to what were average levels of physical activity in most (including high-income) countries until well into the second half of the 20th

century.⁴ Since then, occupations have generally become more sedentary: machines do more household work; more people drive or ride in cars or buses than cycle or walk; and for children as well as adults, active recreation has been largely replaced by watching television or other sedentary pursuits.

This Report has a global perspective, and the Panel agrees that the evidence assessed in this chapter can, with equal validity, be judged inversely. This means that relatively low levels of physical activity — as now typical in high-income countries and in urban-industrial settings in all continents

Box 8.4

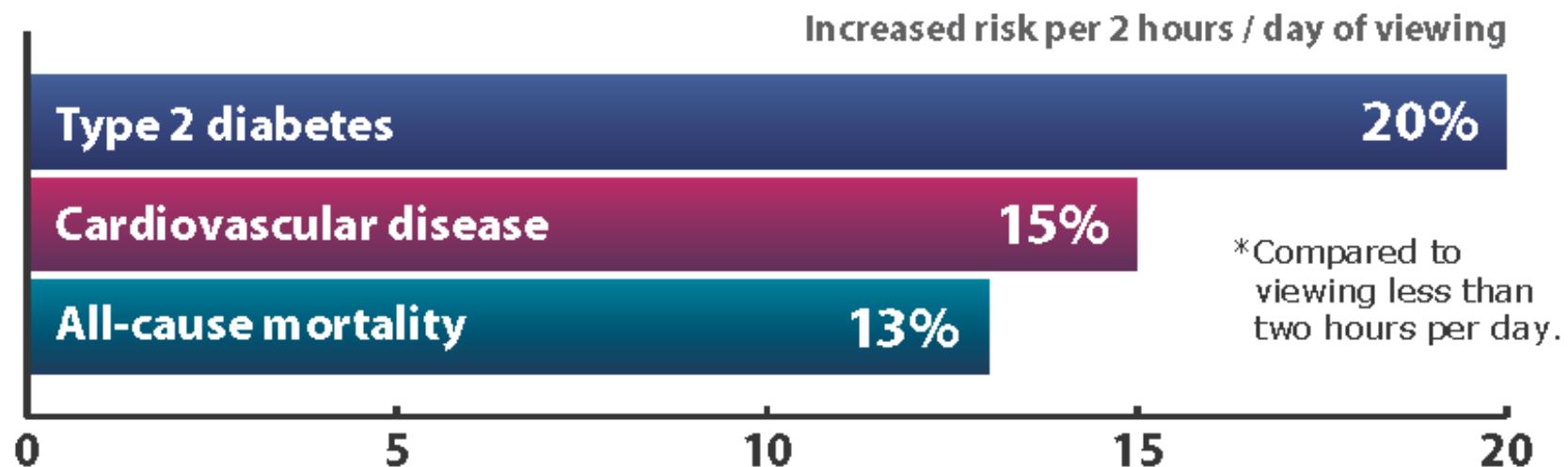
Television viewing

tively straightforward to measure the number of hours someone spends watching television.

As shown in 8.8.8, watching television is associated with the development of obesity (as well as with metabolic and cardiovascular pathology). Such adverse effects are unlikely to be caused simply by the act of watching television. Television watching is a sedentary behaviour; the degree of physical inactivity during television watching appears to be profound compared with other sedentary activities such as reading,

or sitting and talking. Also, time spent watching television displaces opportunities for more active pursuits and increases exposure to promotion of foods that may promote weight gain. Further, watching television may be accompanied by relatively uninhibited consumption of energy-dense foods, which may be eaten in large portion sizes. Measuring the number of hours someone spends watching television not only measures physical inactivity, but also a collection of related behaviour.⁷⁰

Television Viewing



Conclusion: Prolonged TV viewing was associated with increased risk of type 2 diabetes, cardiovascular disease, and all-cause mortality.

RECOMMENDATION 3

FOODS AND DRINKS THAT PROMOTE WEIGHT GAIN

Limit consumption of energy-dense foods¹
Avoid sugary drinks²

PERSONAL RECOMMENDATIONS

Consume energy-dense foods sparingly

Avoid sugary drinks

Consume ‘fast foods’ sparingly, if at all

Sugar and white-flour products are believed to have a direct effect on cancer growth, as well as acting to nullify the positive effects of protective foods such as fiber. In addition, they can significantly add to the risk of breast cancer, says cancer researcher Wayne Martin, of Fairhope, Alabama. *“When someone eats sugar, the body produces insulin, and insulin can promote breast cancer just as estrogen does,”* he explains.

Sugar is remarkably effective at lowering the immune system's ability to work properly.

Eating only three ounces (100 g) at one sitting can reduce the ability of the immune system's white blood cells to destroy bacteria. The immune-suppressive effect starts within 30 minutes after sugar ingestion and can last for up to five hours. As the average American consumes about five ounces (150 g) of sucrose (granular sugar found in processed foods) daily, the immune system of many people is chronically suppressed from dietary factors alone.

RECOMMENDATION 4

PLANT FOODS

Eat mostly foods of plant origin

PERSONAL RECOMMENDATIONS

Eat at least five portions/servings (at least 400 g or 14 oz) of a variety of non-starchy vegetables and of fruits every day

Eat relatively unprocessed cereals (grains)
and/or pulses (legumes) with every meal

Limit refined starchy foods

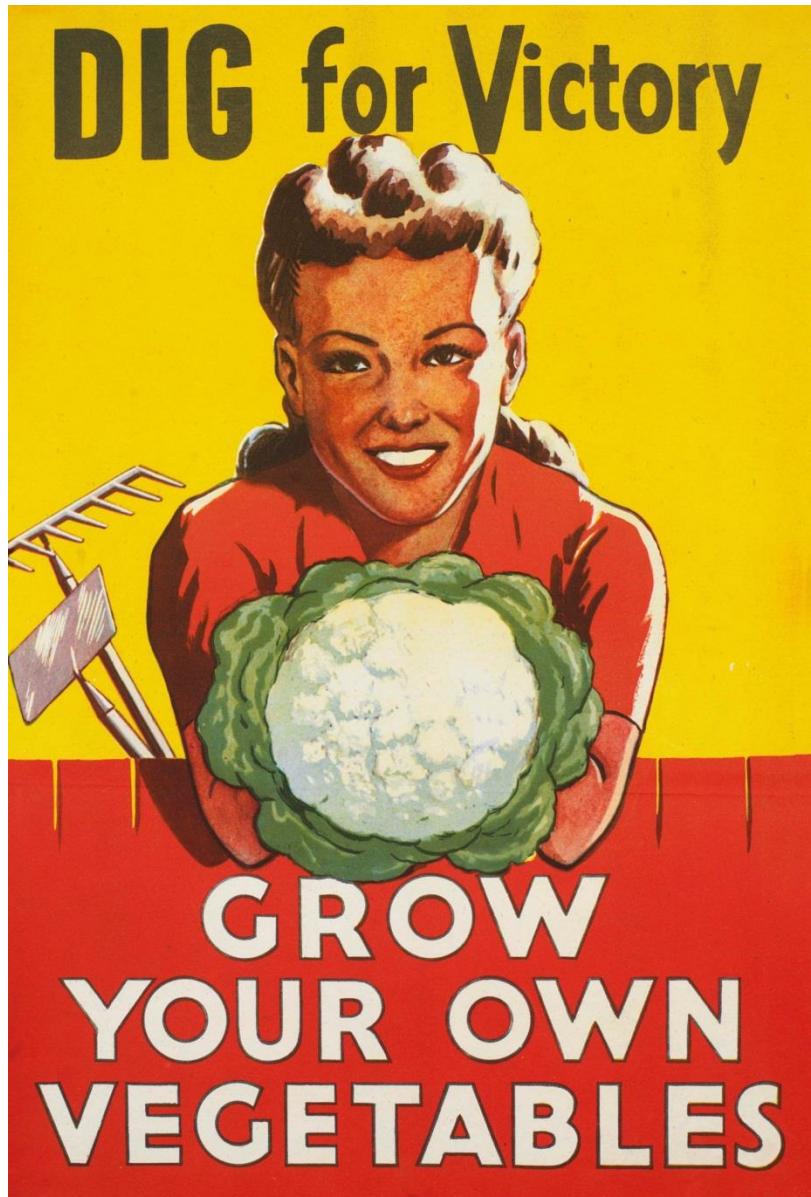
People who consume starchy roots or tubers
as staples also to ensure intake of sufficient
non-starchy vegetables, fruits, and pulses (legumes)

Box 4.9.2

'Organic' farming

So-called 'organic' farming is essentially a reversion to, or revival of, methods of agriculture that were the standard until the introduction of farming systems dependent on chemical fertilisers, pesticides, and biocides, in the second half of the 20th century.

Organic farming avoids or largely excludes the use of synthetic fertilisers and pesticides, plant growth regulators, and livestock feed additives. Farmers tend to rely on crop rotation, crop residues, animal manures, and mechanical cultivation to maintain soil productivity, and to supply plant nutrients and control weeds, insects, and other pests. Organic farming is intended to be indefinitely sustainable.



The rise of degenerative disease has paralleled the adoption of an overly refined and adulterated, high-protein, high-fat diet over the past 100 years.
After World War II, the U.S. population shifted away from regular consumption of whole grains and fresh vegetables, and instead increased its consumption of less wholesome, overly refined foods.

RECOMMENDATION 5

ANIMAL FOODS

**Limit intake of red meat¹ and
avoid processed meat²**

PERSONAL RECOMMENDATIONS

People who eat red meat to
consume less than 500 g (18 oz) a week,
very little if any to be processed

A causal relationship between red meat consumption and cancer is supported by several large studies conducted in the U.S.

Specifically, women with the highest level of meat consumption had double the rate of breast cancer compared to those who consumed small amounts of meat. Men who ate red meat over a five-year period were nearly three times more likely to contract advanced prostate cancer than men consuming mainly vegetarian fare.

High rates of colon cancer have recently been linked to regular intakes of beef, pork, or lamb. In each of these studies, the meat-eating risks are associated with fat intake as well, since American meats are typically high in fat.

Iron overload refers to an excess of body iron. A Danish study found that iron overload significantly raises the risk of developing cancer. Two other reports suggest that even moderately elevated iron accumulations in the body may increase cancer risk. Much of the cancer in the U.S. population today may be related to overconsumption of red meat, a rich source of iron.

Neal Barnard, M.D., of the Physicians Committee for Responsible Medicine, states:

“Although it is unclear whether the iron in the meat promotes tumor growth any more than the fat does, iron definitely contributes to free-radical production, which only increases one's risk of getting cancer.”

RECOMMENDATION 6

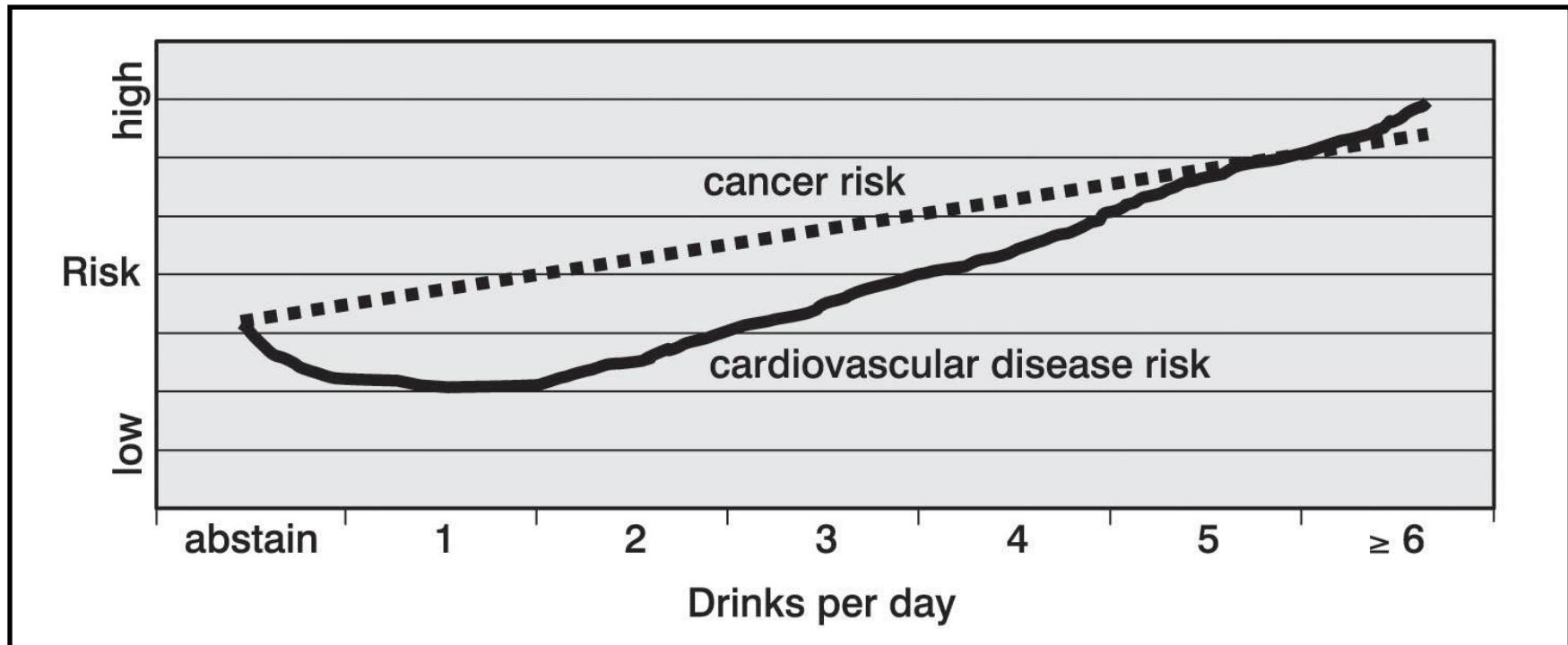
ALCOHOLIC DRINKS

Limit alcoholic drinks¹

PERSONAL RECOMMENDATIONS

If alcoholic drinks are consumed, limit consumption to no more than two drinks a day for men and one drink a day for women

Health Effects of Alcohol Consumption



Alcohol can accelerate the growth of
an existing cancer by suppressing
NK cells, immune cells that would
otherwise help repel cancer.



RECOMMENDATION 7

PRESERVATION, PROCESSING, PREPARATION

Limit consumption of salt¹

Avoid mouldy cereals (grains) or pulses (legumes)

PERSONAL RECOMMENDATIONS

Avoid salt-preserved, salted, or salty foods;
preserve foods without using salt

Limit consumption of processed foods with added salt
to ensure an intake of less than 6 g (2.4 g sodium) a day

Do not eat mouldy cereals (grains) or pulses (legumes)

RECOMMENDATION 8

DIETARY SUPPLEMENTS

Aim to meet nutritional needs through diet alone¹

PERSONAL RECOMMENDATIONS

Dietary supplements are not recommended for cancer prevention

Also from the report: “*Although some studies in specific, usually high-risk, groups have shown evidence of cancer prevention from some supplements, this finding may not apply to the general population. Their level of benefit may be different, and there may be unexpected and uncommon adverse effects. Therefore it is unwise to recommend widespread supplement use as a means of cancer prevention.*”

Is there a bias against nutritional supplements in medical literature?

You be the judge.

“Despite no evidence of any clinical benefits, dietary supplement use is increasingly common among older adults, with almost a 50% increase in the use of multiple supplements.”

CANCER

and

Vitamin C

Ewan
Cameron

Linus
Pauling

Figure 2.2

Food, nutrition, obesity, physical activity, and cellular processes linked to cancer

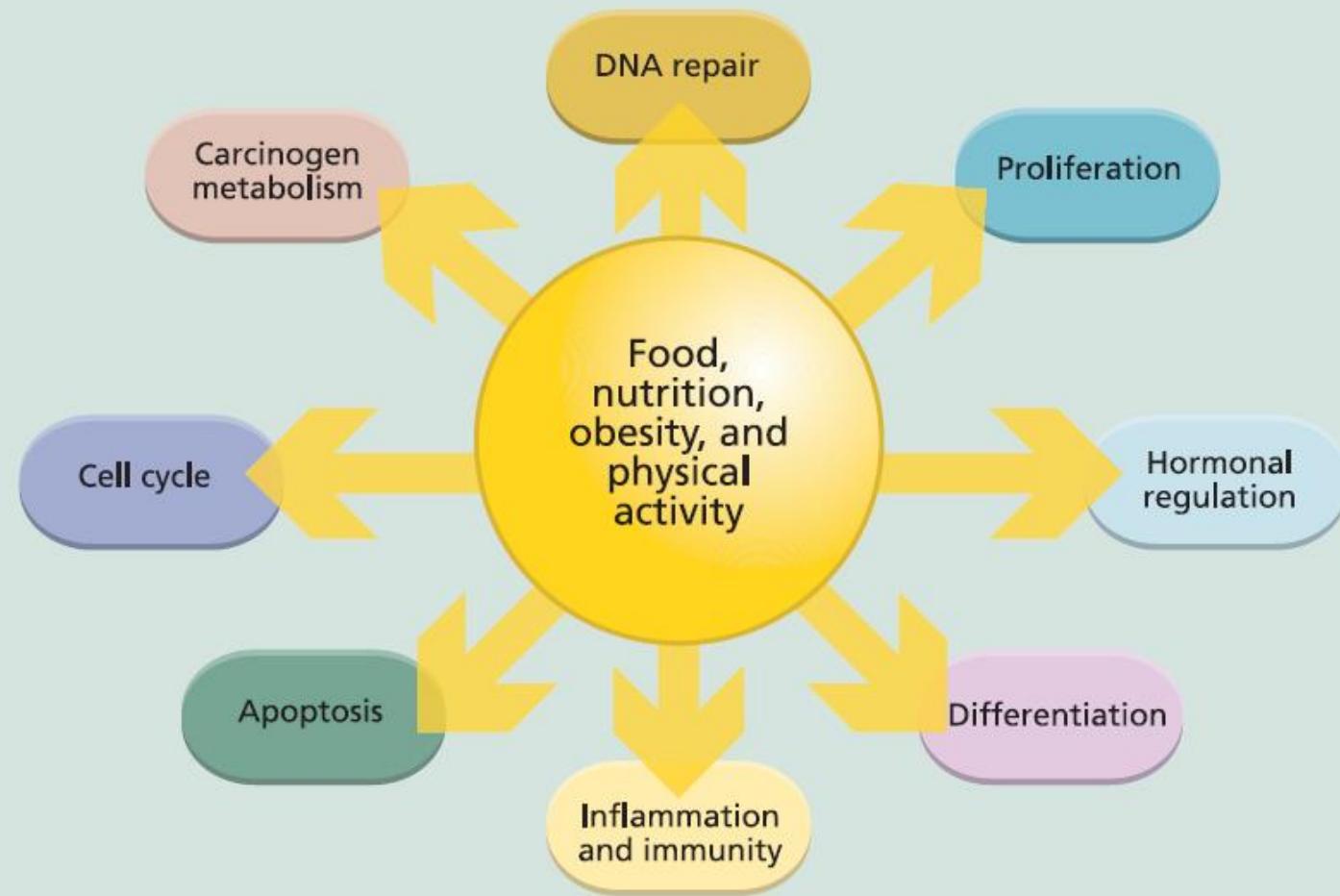
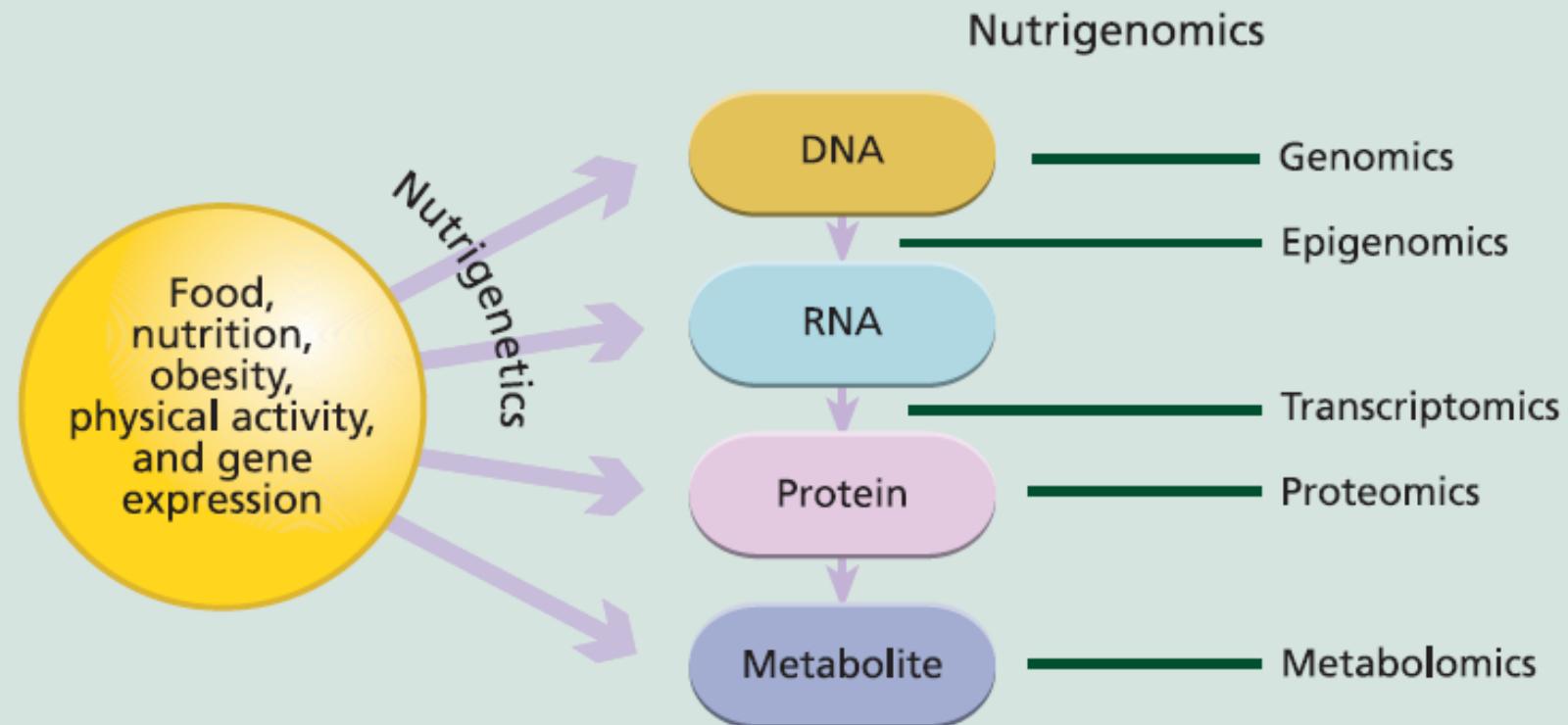


Figure 2.1

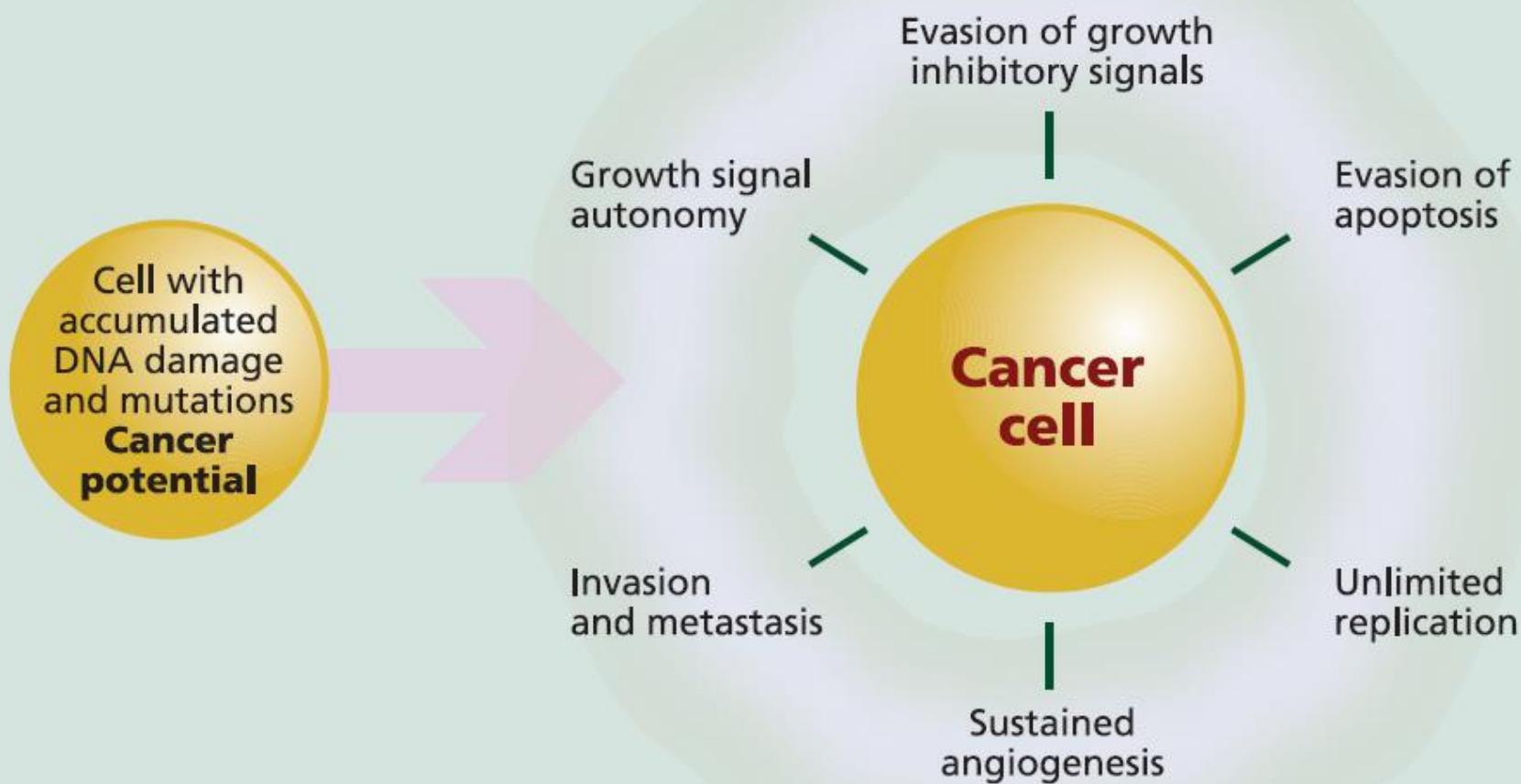
The basis for the study of food, nutrition, obesity, physical activity, and the cancer process



The genetic message in the DNA code is translated into RNA, and then into protein synthesis, and so determines metabolic processes. Research methods called '-omics' address these different stages.

Figure 2.4

The six hallmarks of cancer



Adapted from Hanahan and Weinberg¹¹¹

Cancer Facts

- ◆ Sometimes the nucleus of a cell loses the ability to regulate cell growth, producing a mutant cell
- ◆ A mass of mutant cells is called a neoplasm (tumor)
- ◆ A neoplasm can be malignant (cancerous) or benign (noncancerous)
- ◆ Malignant tumors can spread and crowd out normal tissue

Causes and Prevention

- ◆ Metastasis is the process by which cancer cells spread from their primary site to a secondary site
- ◆ Cancer is caused by both external and internal factors
- ◆ Ten or more years often elapses from the time of cell mutation until actual detection of the cancer



Causes and Prevention

- ◆ Carcinogens are any cancer-causing agents
- ◆ All cells have regulatory genes called proto-oncogenes
- ◆ Disruptions in proto-oncogenes caused by environmental factors or replication errors can result in a cancer-producing gene (oncogene)
- ◆ Suppressor genes control cell growth

Causes and Prevention

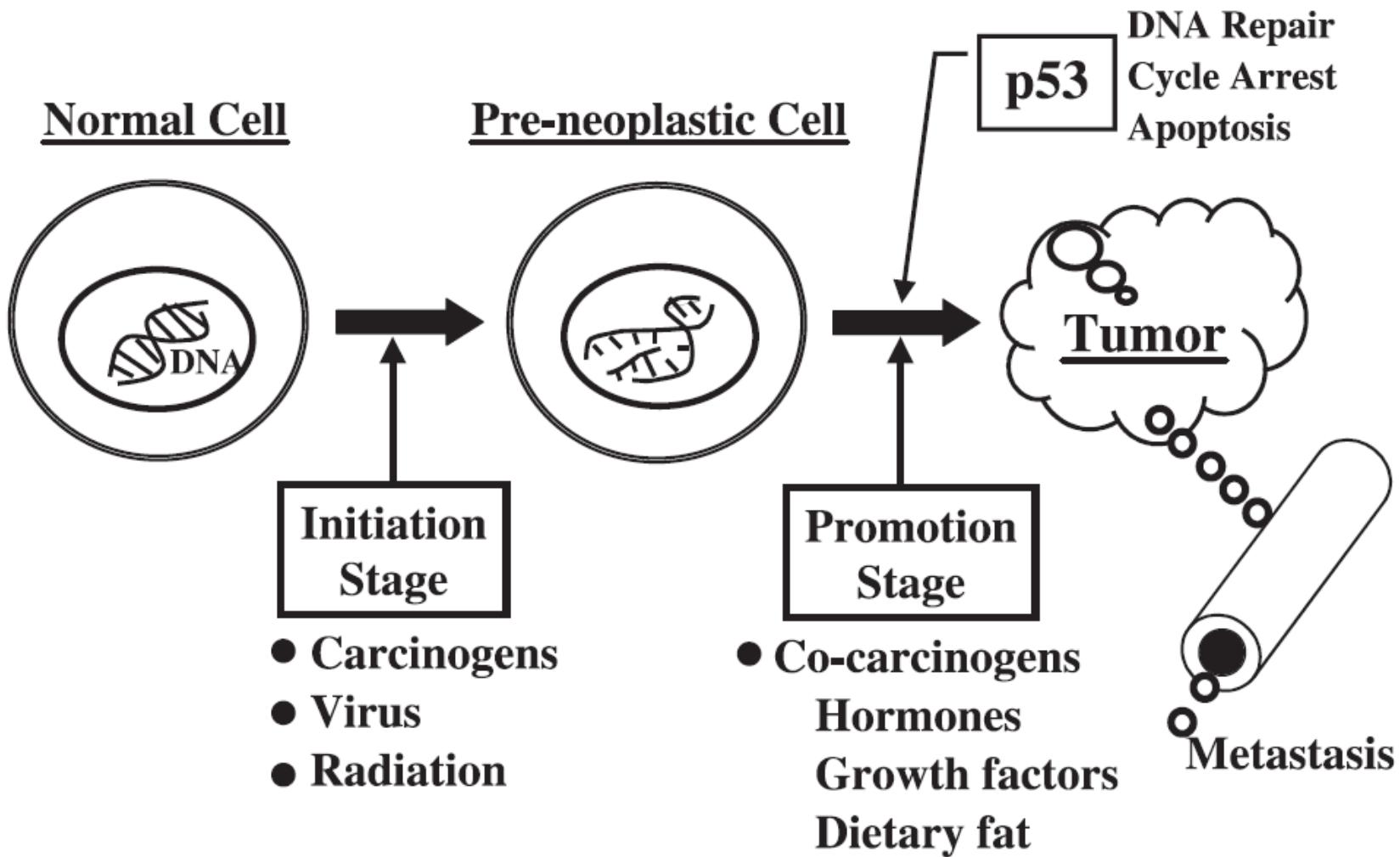
- ◆ Cancer requires the production of a cancer-producing gene as well as failure of the immune system to recognize and destroy mutant cells
- ◆ Scientists believe that more than 80% of all cancers are associated with lifestyle factors that are easily controlled (diet, smoking, and sun exposure)

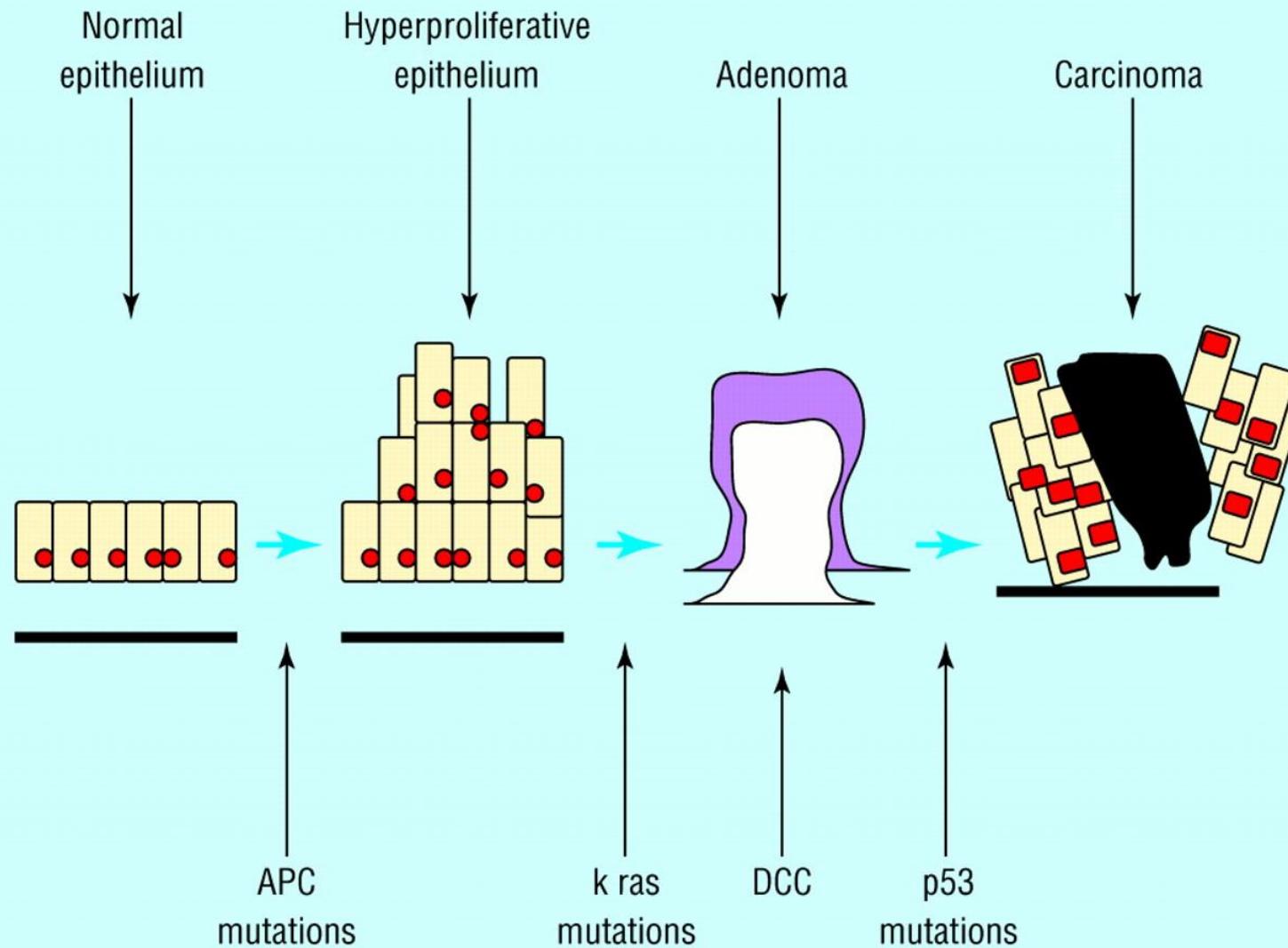


The “Two Hit” Theory of Cancer

- ◆ Initiator substance causes initial damage to the DNA. No cancer has yet formed, but once initiated, all future cells will carry the initial damage.
- ◆ Promoter substance causes additional damage to DNA sufficient to give the cell cancer-forming properties. Once initiated and promoted, the cell has the potential to become cancerous.

Tumor Development Model



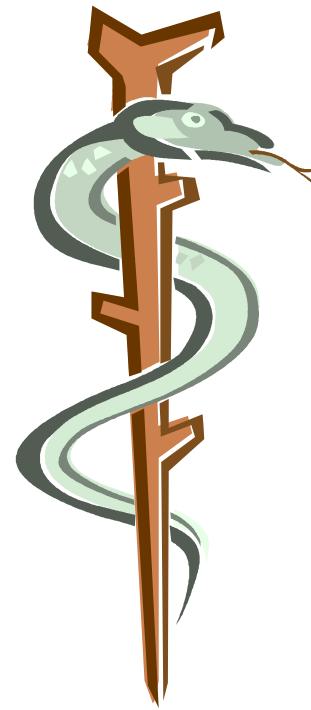


ABC of colorectal cancer: Molecular basis for risk factors

BMJ. 2000 Oct 7;321(7265):886-9. <http://www.ncbi.nlm.nih.gov/pubmed/11021873>

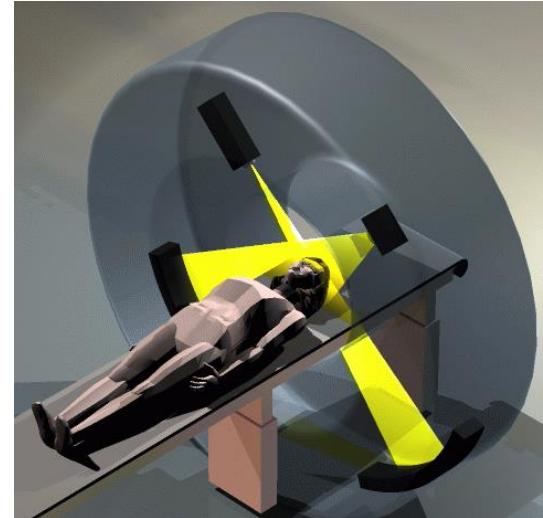
Orthodox Cancer Treatment

- ◆ Radiation
- ◆ Chemotherapy
- ◆ Surgery



Radiation Oncology

“With these significant and noteworthy exceptions, the vast majority of studies show that radiation cannot cure cancer, and that it does not usually extend life for people with the disease.”*



*Cancers where radiation therapy may be useful include early Hodgkin's disease, lymphosarcoma, inoperable local prostate cancer, and localized tumors of the head, neck, and cervix.

Chemotherapy

A 1986 McGill Cancer Center study found that 58 of 79 oncologists surveyed would not receive chemotherapy if they were to develop lung cancer. Why?

“The ineffectiveness of chemotherapy and its unacceptable degree of toxicity”



Chemotherapy, alone or combined with radiation, may be used before, after or instead of surgery in treating lung cancer

COUNTERTHINK

"CHEMOTHERAPY STICKUP"



Surgery

Of the three main cancer treatments, surgery is the least harmful. However, its main value is with localized tumors. Once the cancer has spread to other parts of the body, those metastases are generally considered to be inoperable.

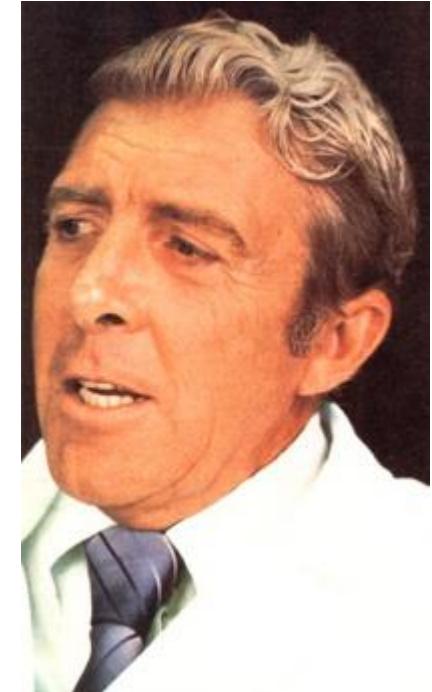


Surgery only removes the tumor, it does not address the cause of the cancer.

What is the cause of the Cancer?

When a woman develops breast cancer and receives surgery, radiation, and chemotherapy, there is a rationale for why those treatments are supposed to work. However, a more fundamental question needs to be asked:

“Why did she get cancer in the first place?”



Harold Manner, PhD

Initiators and Promoters of Cancer

Substances or conditions which may cause genetic damage sufficient to initiate and promote cancer include:

- Synthetic organic chemicals
- Irradiation of food
- Genetically modified foods (GMO)
- Radiation from Diagnostic Imaging



Box 4.9.3**Regulation of additives and contaminants**

Any chemicals that have a useful function in the production, processing, or preservation of foods or drinks may nevertheless be toxic, and possibly mutagenic or carcinogenic. For this reason, food additives and contaminants, such as traces of chemicals used in industrial agricultural production, are subject to international and national surveillance and regulations.

They are a cause for concern and vigilance because some, and in particular agricultural chemicals, are known to be toxic in experimental settings, though at levels well above those found in foods and drinks.

Annual World Production of Synthetic Organic Chemicals

- ◆ 1930 – 1 million tons
- ◆ 1950 – 7 million tons
- ◆ 1970 – 63 million tons
- ◆ 1990 – 500 million tons
- ◆ 2000 – 1 billion tons



Total Toxic Burden

- ◆ More than 90% of the 85,000 chemicals produced annually have never been screened for toxicity
- ◆ Chemical manufacturers are not required to prove safety
- ◆ The legal burden is on the government to prove that a product is dangerous

Total Toxic Burden

- ◆ According to the EPA in 2002 through their “Toxic Release Inventory” tracking system, over 7.1 billion pounds of 650 different industrial chemicals were released in the air and water, 266 of which are linked to birth defects.
- ◆ Worldwide, nearly 80 billion pounds of toxins are released annually.
- ◆ Some of these toxins affect human health in microgram doses.

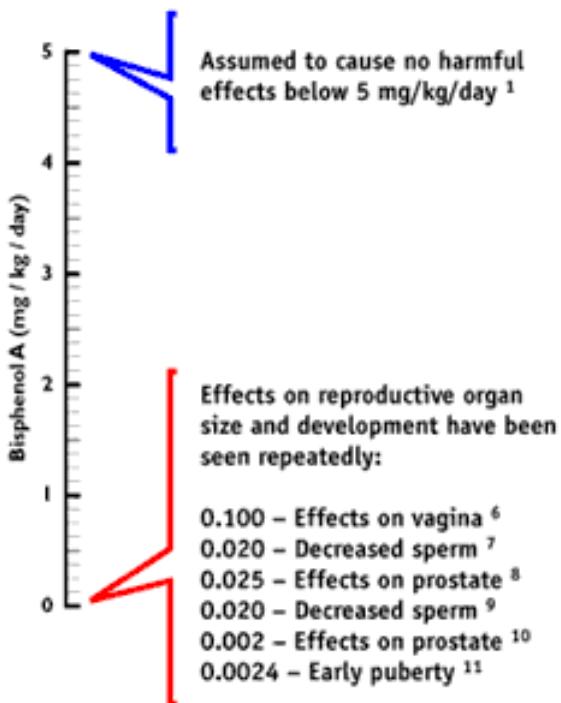
Low Dose Toxic Effects

“A growing body of literature links low dose chemical exposures in animal studies to a broad range of health effects previously unexplored in high dose studies. In low dose testing, scientists are using sophisticated techniques to measure subtle but important changes in the functioning of apparently undamaged organ systems, including alterations in immune function (such as antibody response), enzyme activity, hormone levels, cellular changes in tissues, neurobehavioral parameters, organ growth, and hormone and neurotransmitter receptor levels.”

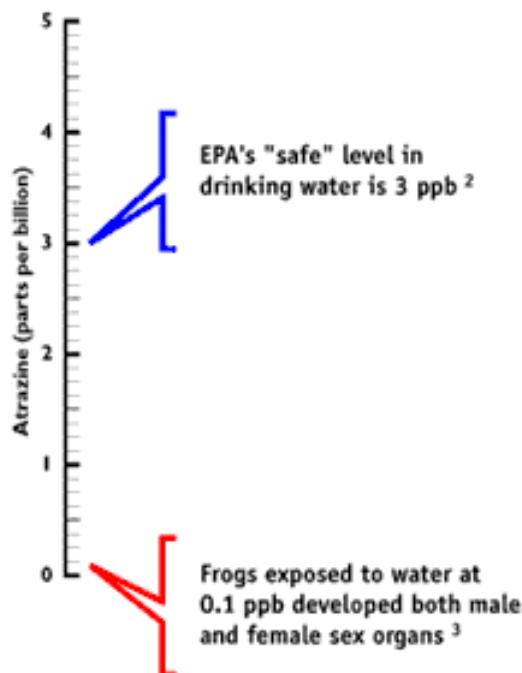
What is a "Safe Dose?"

Doses assumed safe by regulators harm animals in low dose studies

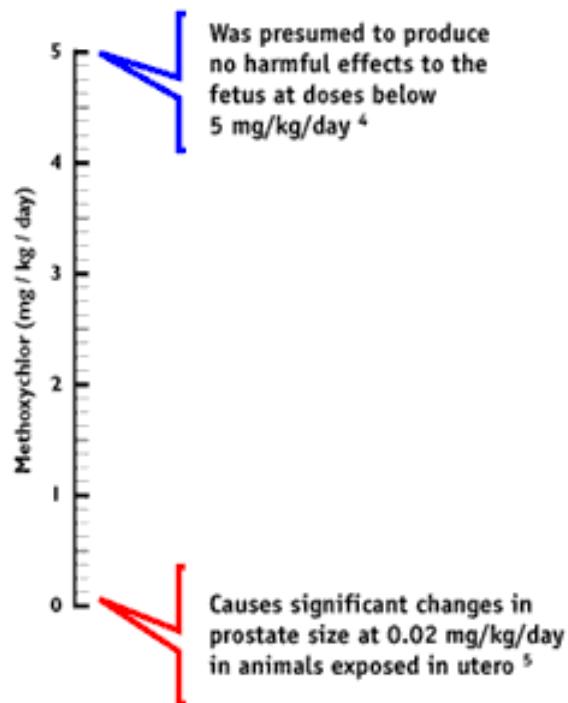
Bisphenol A industrial chemical



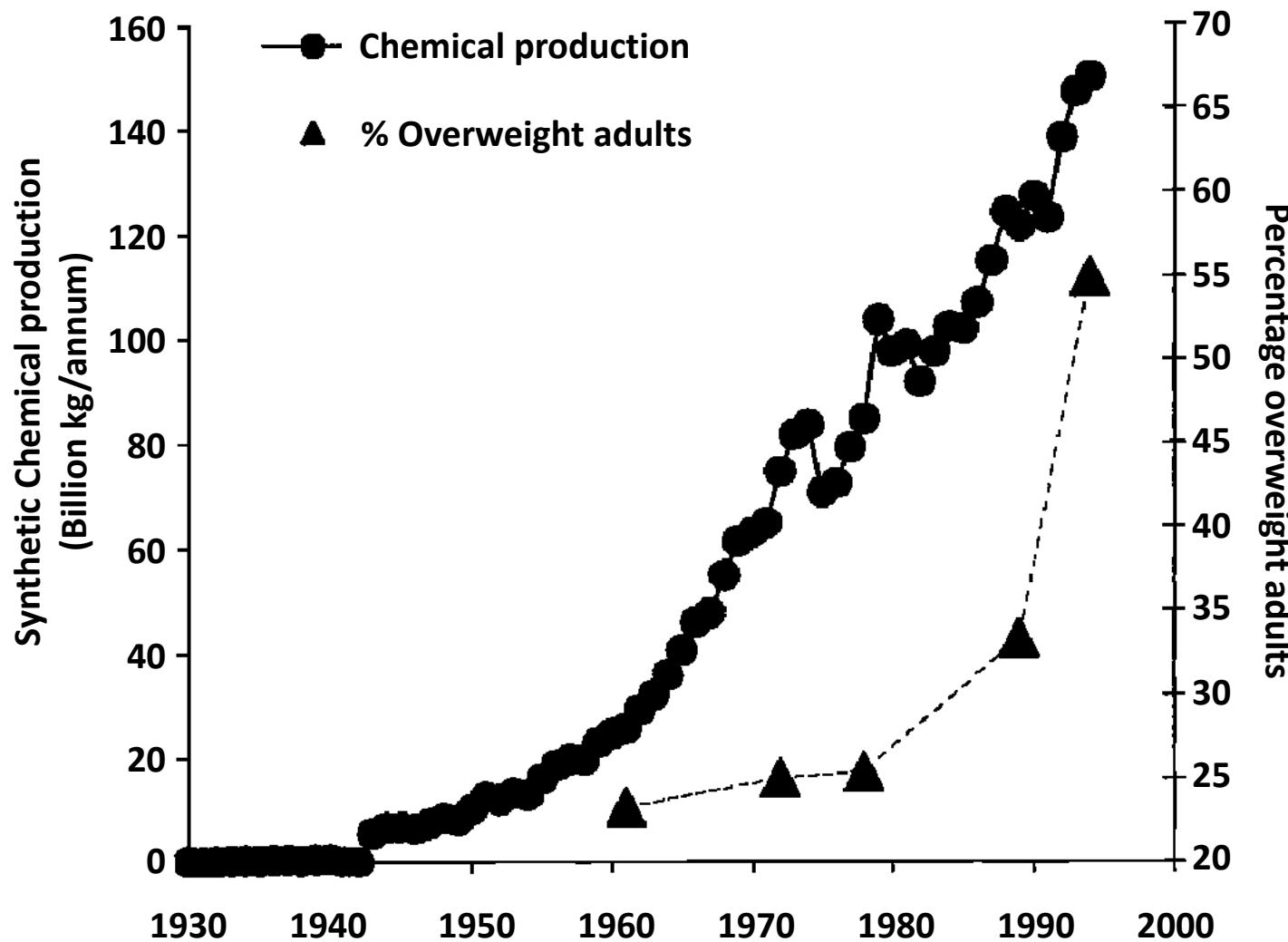
Atrazine herbicide



Methoxychlor insecticide



Do Chemical Toxins Cause Obesity?



Irradiation of food

Food irradiation exposes food to the equivalent of 2.5 million chest X-rays.

Many adverse health effects have been observed in animals fed irradiated foods, including premature death, mutations, fetal death and other reproductive problems, residual radioactivity, immune system dysfunction, fatal internal bleeding, a rare form of cancer, organ damage, blood disorders, tumors, nutritional deficiencies and stunted growth.

Irradiation of food

High-energy irradiation produces complex chemical changes in food with the formation of poorly characterized radiolytic products, including benzene, organic peroxides and carbonyls. Radiolytic products kill bacteria, molds and larvae and thus ensure spoilage-free food, a major attraction to the purveyors of marginal produce and contaminated poultry. However, concentrated extracts of these products have never been tested for cancer and other delayed adverse effects.

Irradiation of food

“An increase in concentration of a mutagen in food by irradiation will increase the incidence of cancer. It will take four to six decades to demonstrate a statistically significant increase in cancer due to mutagens introduced into food by irradiation. When food irradiation is finally prohibited, several decades worth of people with increased cancer incidence will be in the pipeline.”

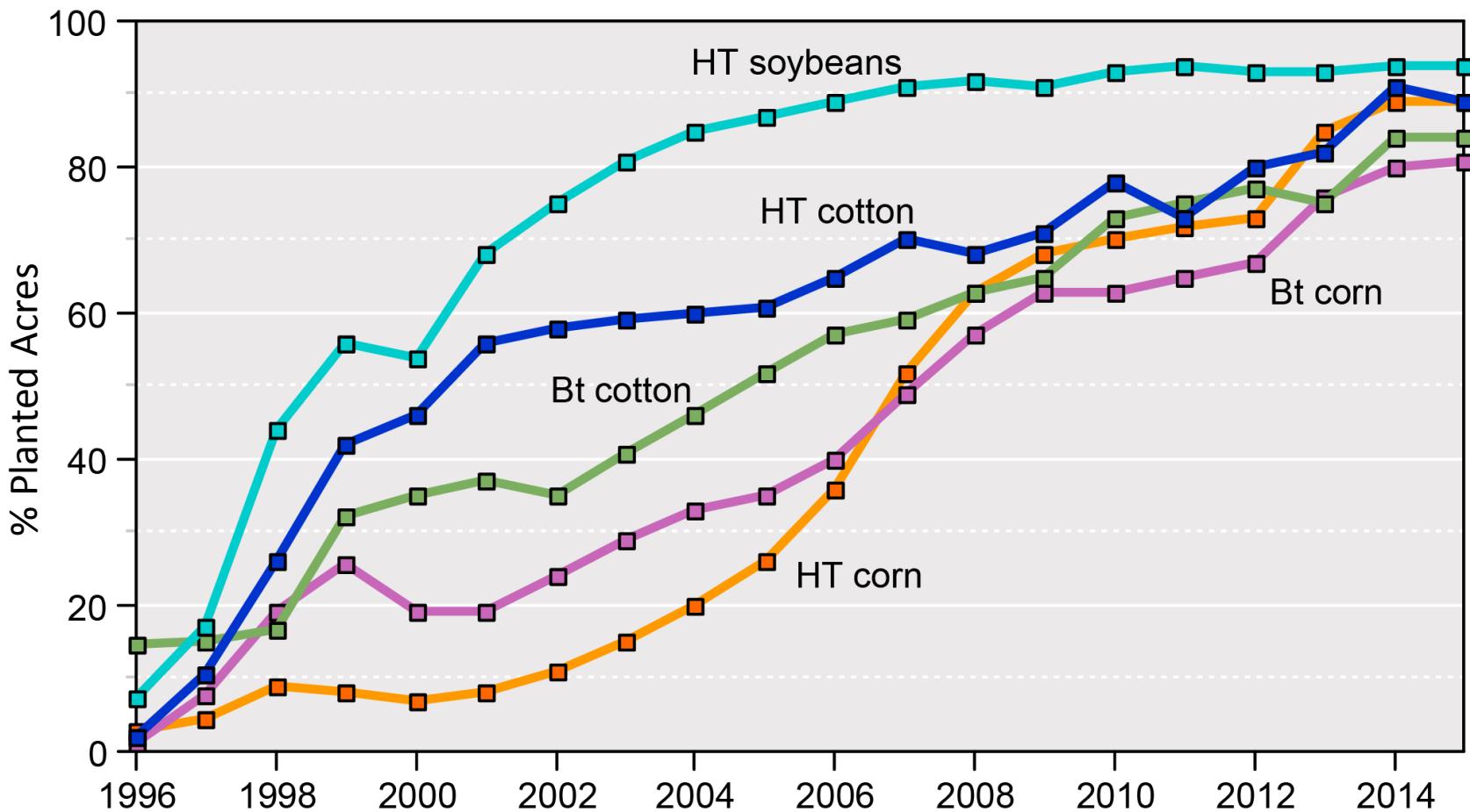
Genetically Modified (GMO) Crops

- ◆ 94% of soybeans
- ◆ 92% of corn
- ◆ 94% of cotton
- ◆ 90% of canola
- ◆ 95% of sugar beets



These ‘Roundup Ready’ crops are genetically engineered to be highly resistant to the Monsanto pesticide Roundup

Adoption of GMO Crops





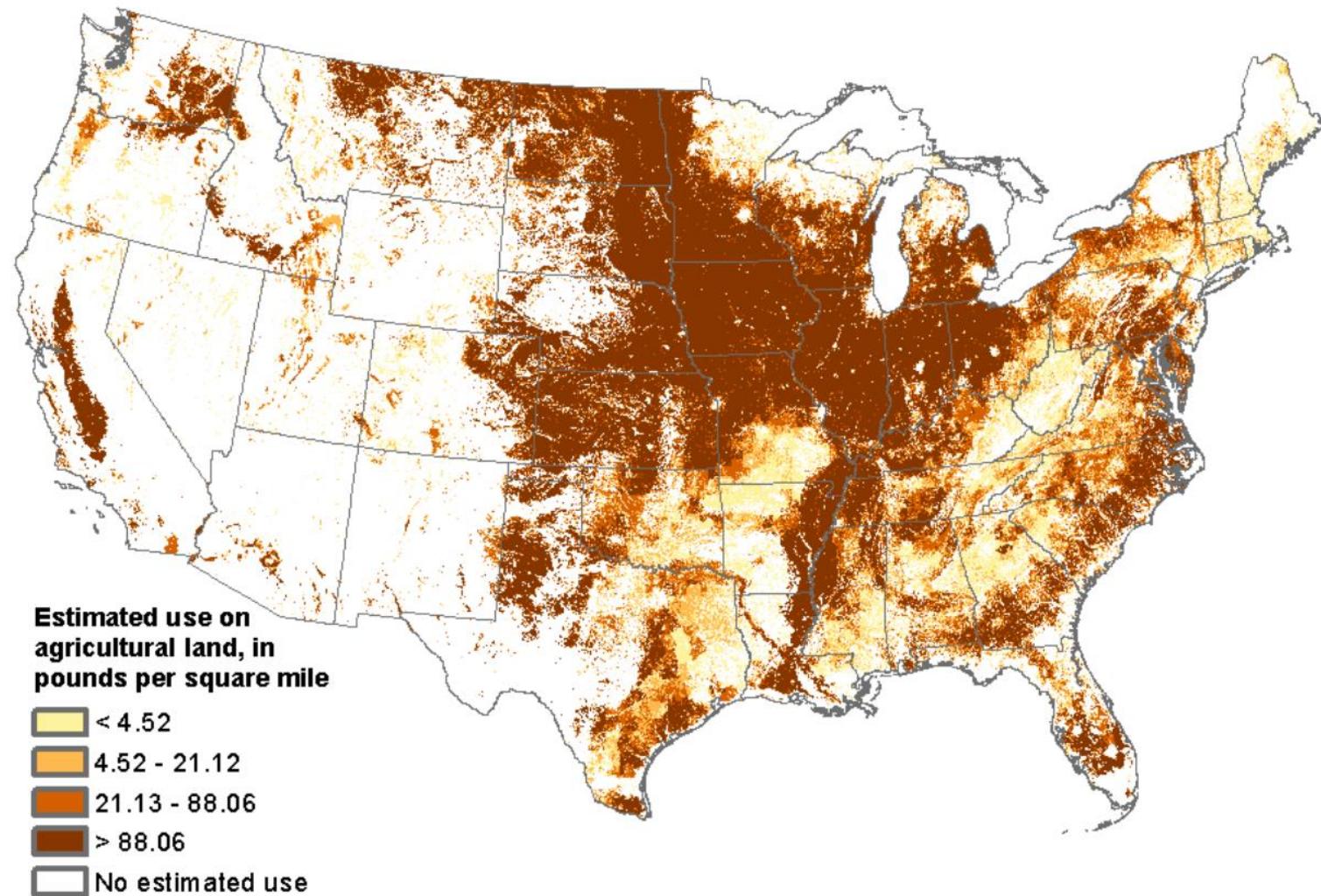
by CHRIS KELLY © 1999

Monsanto's herbicide Roundup

- ◆ Glyphosate, the main ingredient in Roundup, has become the most used agricultural chemical of all time
- ◆ In March 2015 the WHO determined that glyphosate is “probably carcinogenic to humans”



Glyphosphate use in the US



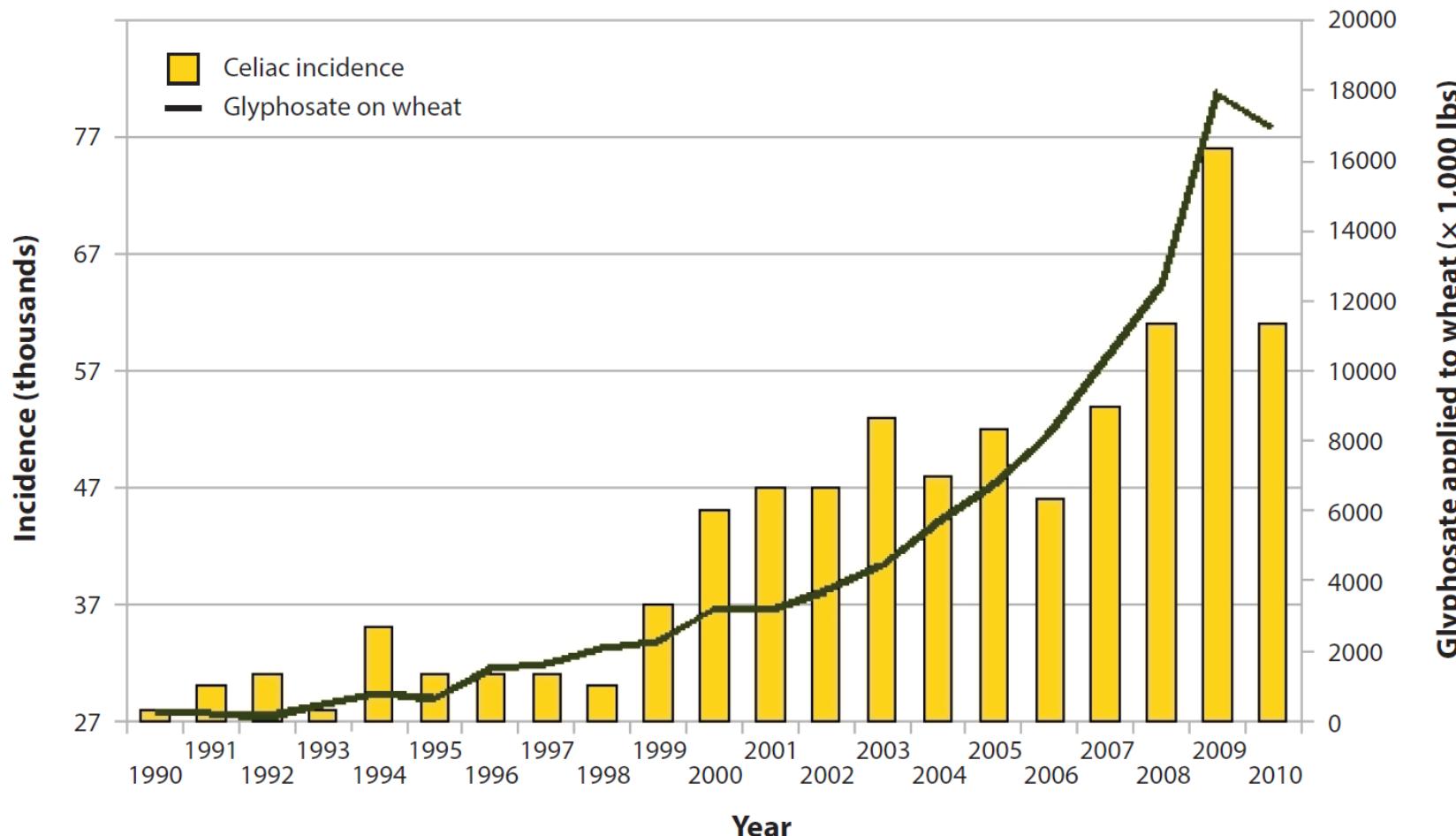
Glyphosate

A Root Cause of Chronic Inflammation?

- ◆ In the intestines, glyphosate damages the epithelial tight junction tissue on contact, weakening the barriers that protect us from the barrage of other environmental toxins to which we are exposed.
- ◆ Injury to the tight junction membrane in the gut can lead to intestinal permeability. With the collapse of the tight junction firewalls, all organ systems go under duress.

Celiac Sprue

Is it the gluten or the glyphosate?



Genetically Modified Food

“Genetic engineering bypasses conventional breeding by using artificially constructed parasitic genetic elements, including viruses, as vectors to carry and smuggle genes into cells. Once inside cells, these vectors slot themselves into the host genome. The insertion of foreign genes into the host genome has long been known to have many harmful and fatal effects including cancer of the organism.”

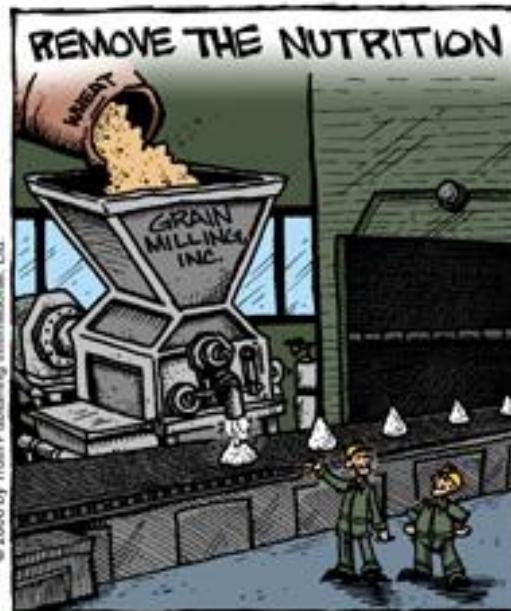
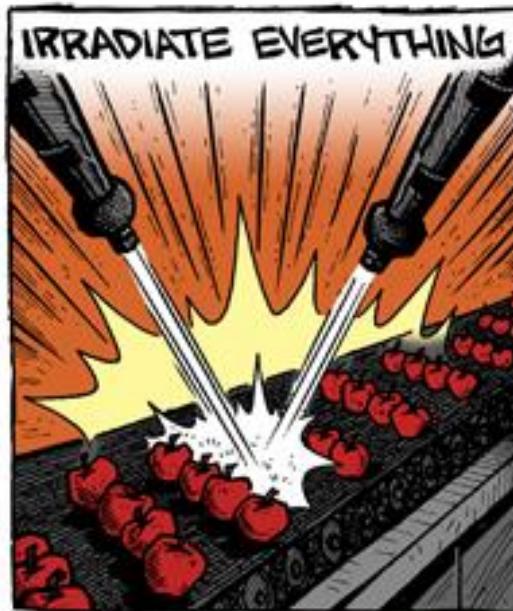
Professor Mae Wan-Ho
Department of Biology, Open University, UK

Genetically Modified Food

"The fact is, it is virtually impossible to even conceive of a testing procedure to assess the health effects of genetically engineered foods when introduced into the food chain, nor is there any valid nutritional or public interest reason for their introduction."

Dr. Richard Lacey
Professor of Food Safety
Leeds University, UK

COUNTERTHINK - "THE PLAN FOR THE GLOBAL FOOD SUPPLY"

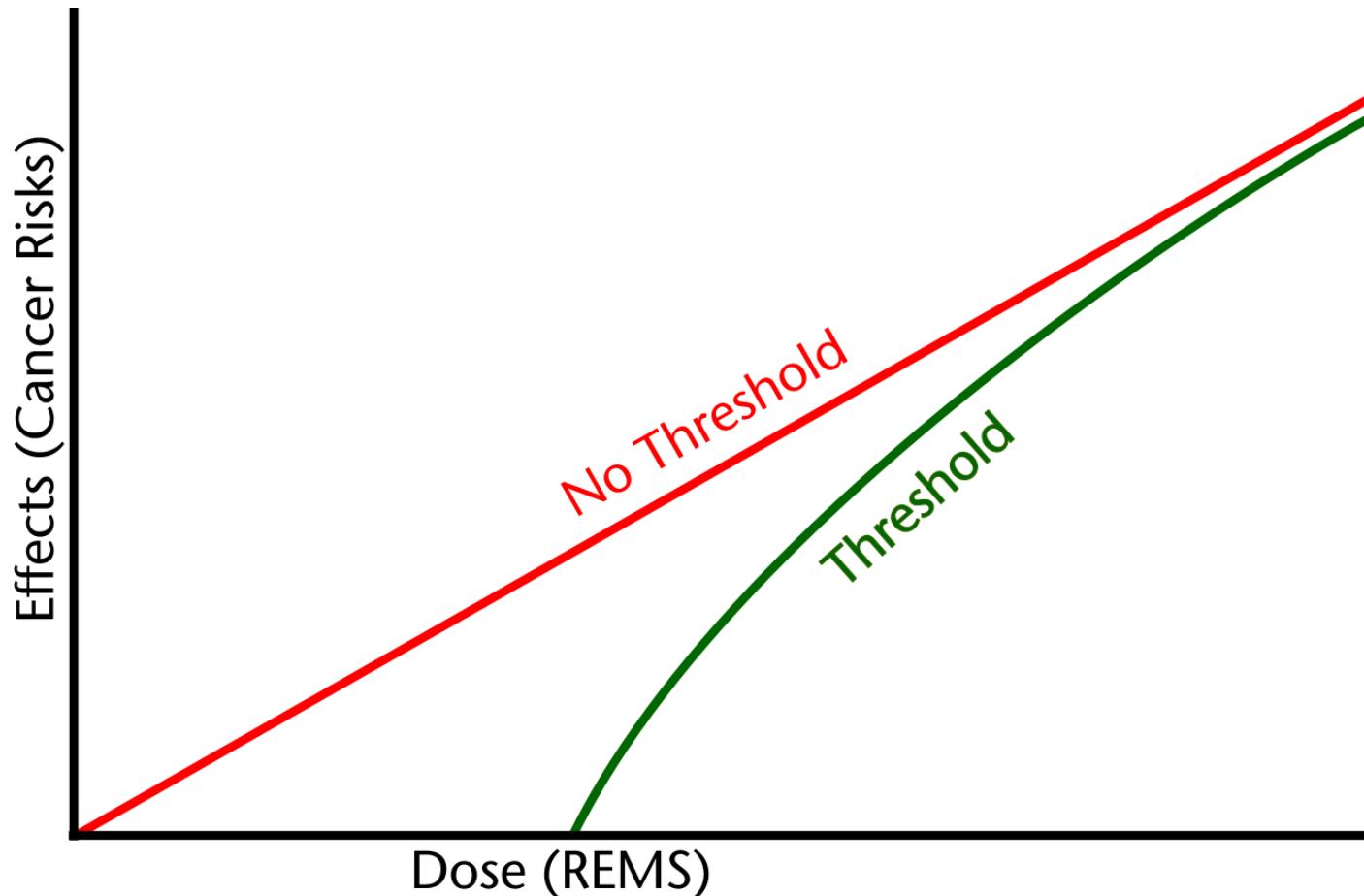


CONCEPT - MIKE ADAMS

ART - DAN BERGER

WWW.NATURALNEWS.COM

Biological Effects of Ionizing Radiation (BEIR)



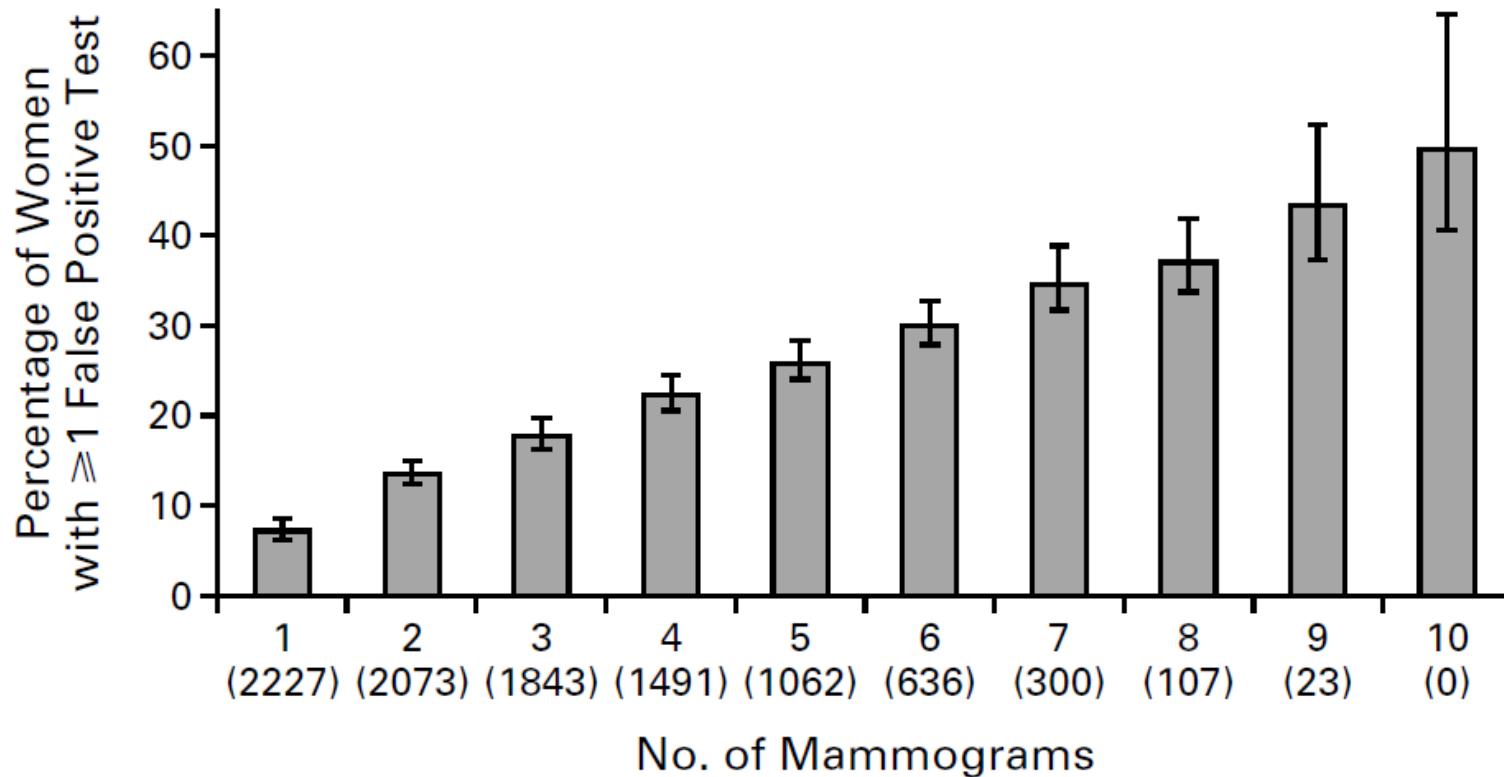
"The scientific research base shows that there is no threshold of exposure below which low levels of ionizing radiation can be demonstrated to be harmless or beneficial"

Does mammography cause more breast cancer than it detects?



- ◆ *"The data therefore show that for every 1000 women screened throughout 12 years, one breast-cancer death is avoided but the total number of deaths is increased by six."*
- ◆ *"We conclude that screening for breast cancer with mammography is unjustified."*

Screening Mammography



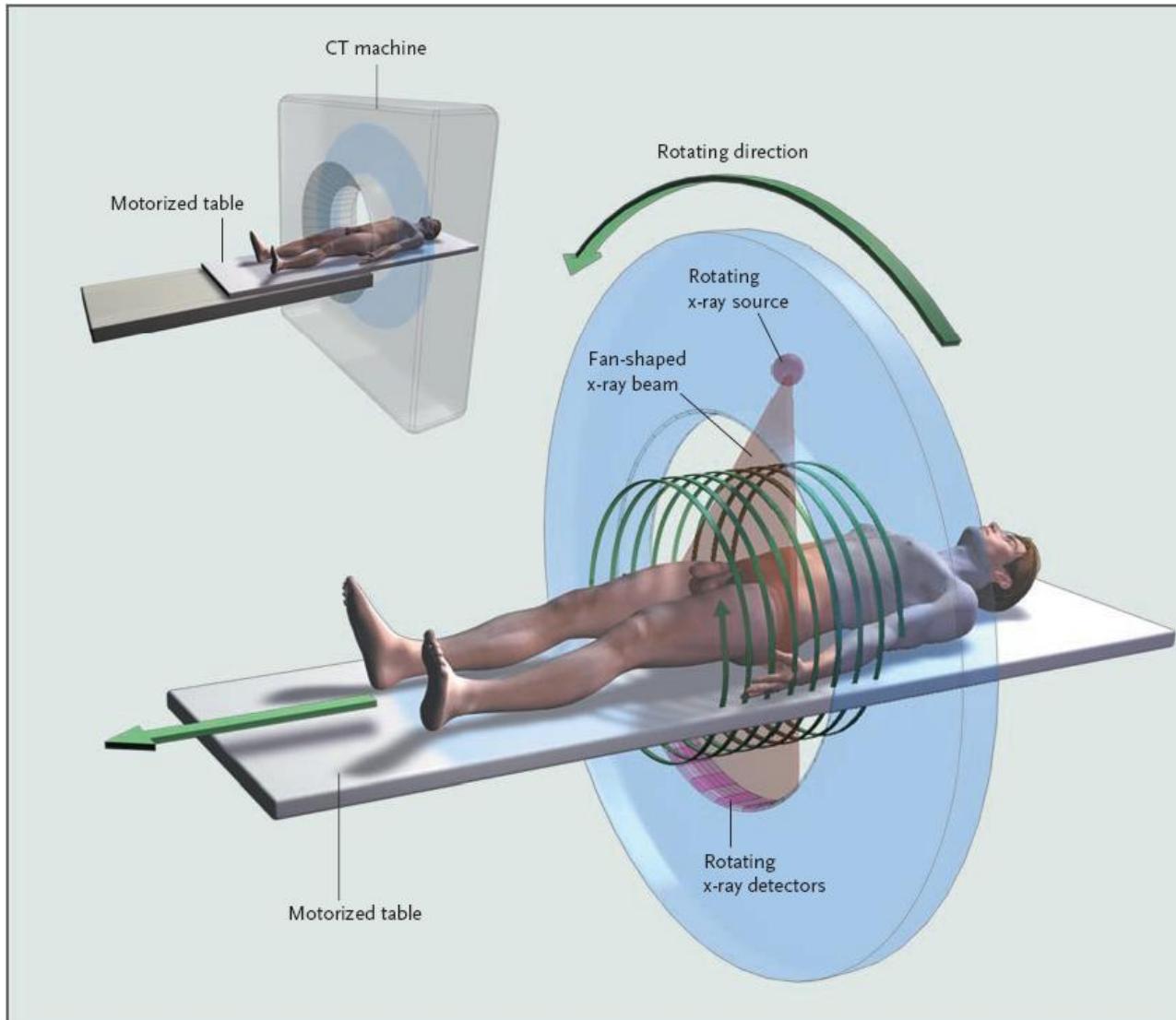
The risk of a false positive test increased with the number of breast-cancer screening tests, so that by the time a woman had undergone 10 tests, the estimated cumulative risk of at least one false positive mammogram was about 50 percent

Study Questions Value of Mammograms



<https://www.youtube.com/watch?v=sBd-DXfgUgU>
BMJ 2-11-14 www.ncbi.nlm.nih.gov/pubmed/24519768

64 slice CT



Fast CT can produce amazing images

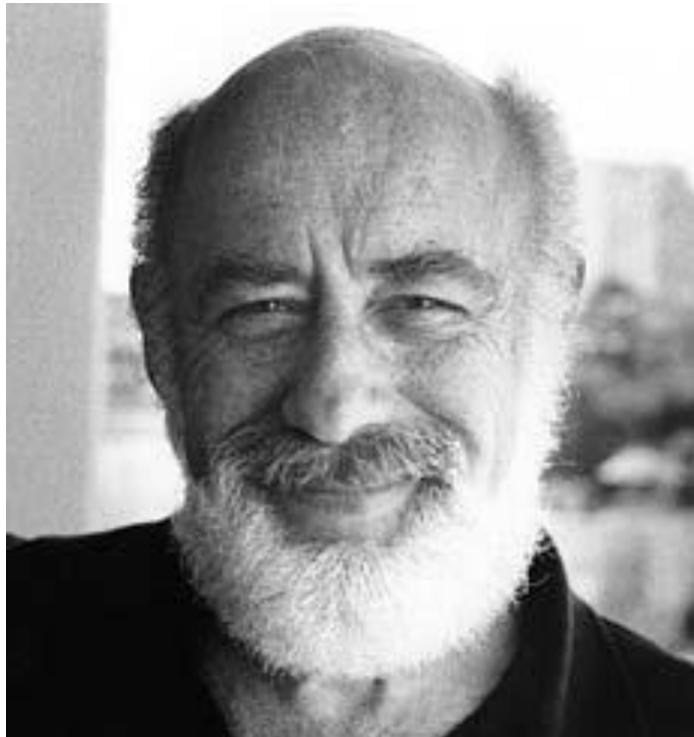


Computed Tomography

An Increasing Source of Radiation Exposure

- ◆ Full body CT scans involve 100 times the radiation used for breast mammography
- ◆ About one third of all CT scans are not justified by medical need
- ◆ 20 million adults and, crucially, more than 1 million children per year in the United States are being irradiated unnecessarily
- ◆ In light of these considerations, and despite the fact that most diagnostic CT scans are associated with very favorable ratios of benefit to risk, there is a strong case to be made that too many CT studies are being performed in the United States

John W. Gofman, MD, PhD (1918–2007)



Co-discoverer of protactinium-232, uranium-232 and protactinium-233

Tasked by J. Robert Oppenheimer to begin isolating plutonium needed for the Manhattan Project

Named the ‘father of clinical lipidology’ for his discovery of the role of LDL and HDL in heart disease

In 1962 he was tasked by Edward Teller to create the Biomedical Research Division at Lawrence Livermore National Laboratory

Radiation from Medical Procedures

- ◆ Based on 40 years of studying the effects of low dose radiation on humans, Dr. Gofman estimates:
 - 50% of all cancer is related to exposure to ionizing radiation from mammography, X rays, and other medical sources
 - 60% of heart disease is related to ionizing radiation



War on Cancer

In 1971 President Richard Nixon declared war on cancer and signed the National Cancer Act to make the “conquest of cancer a national crusade.”

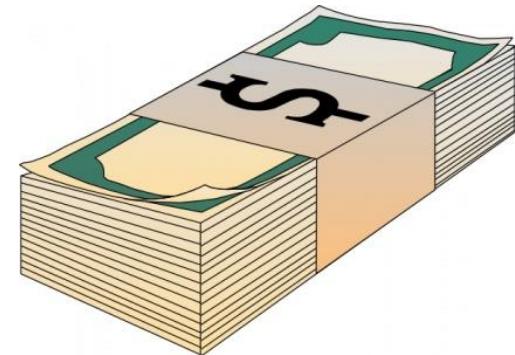
The cancer industry is a big business. Today the annual expenditure for cancer treatment is \$93.2 billion.

In the US, there are now more people who make their living treating cancer, than there are cancer patients.



The High Cost of Cancer Treatment

Cancer care is very expensive. For example, one 40 year old woman wrote that for nine months of treatment for early-stage breast cancer, the total cost of care billed was \$224,725. This was for her lumpectomy surgery, four rounds of chemotherapy, and 33 rounds of radiation. This did not include the cost of her prescribed oral medications.

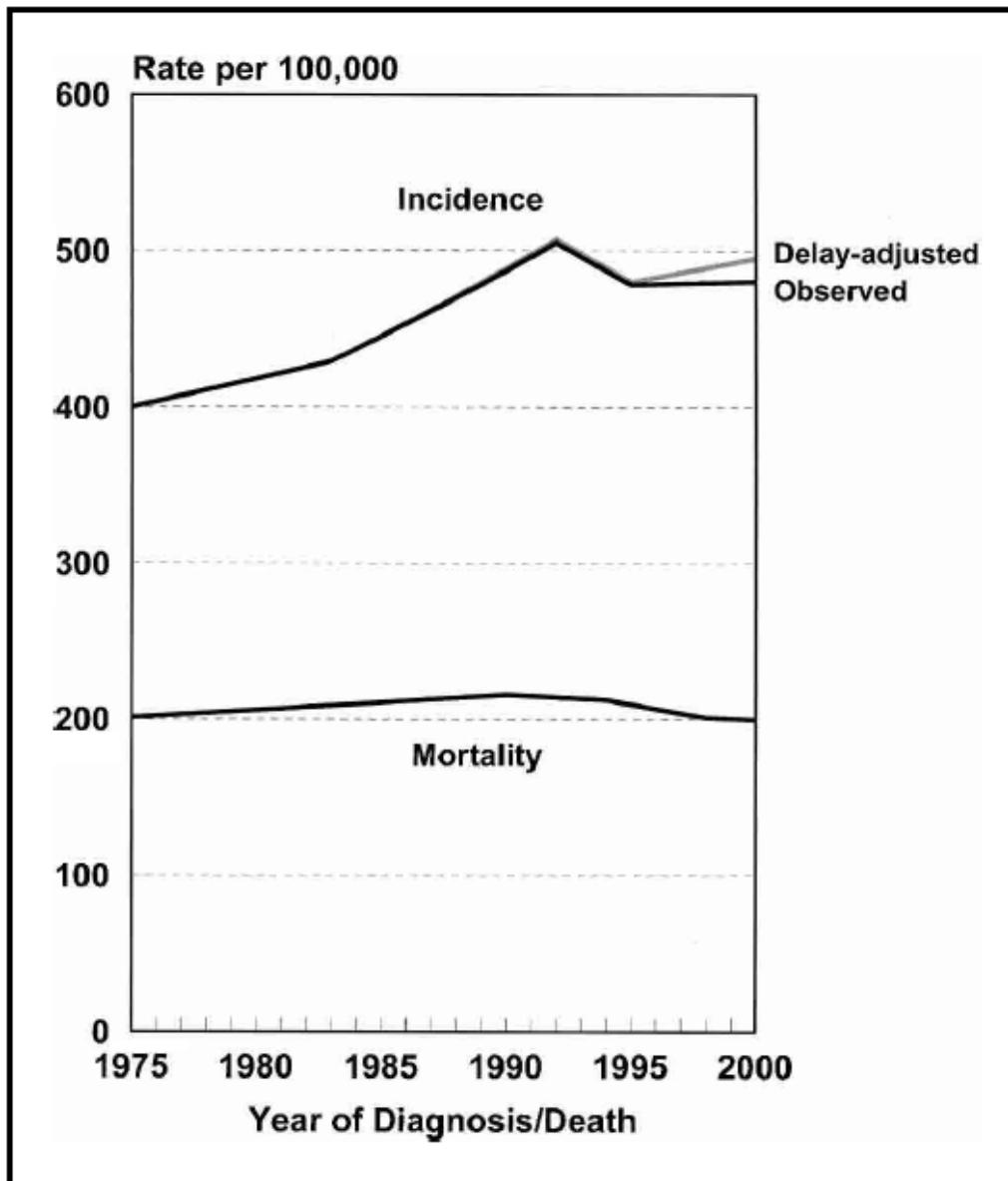


Are We Winning the War on Cancer?

John C. Bailar III, MD, PhD the former editor of the Journal of the National Cancer Institute wrote:

“Some 35 years of intense and growing efforts to improve the treatment of cancer has not had much overall effect on the most fundamental measure of clinical outcome – death. Overall, the effort to control cancer has failed, so far, to attain its objectives.”

JNCI: Annual Report to the Nation on the Status of Cancer, 1975–2000

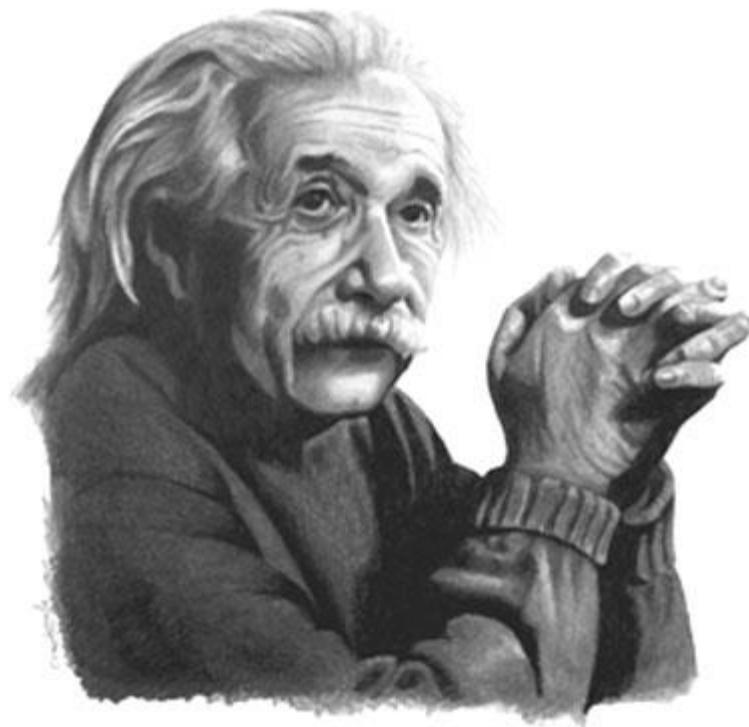


Taking a closer look at the word 'cancer'



https://www.youtube.com/watch?v=D-Y6N4_SG2U

“Insanity is continuing to do the same thing over and over again, and expecting different results.”



Cancer Risk Formula

$$\frac{\text{strength of carcinogen} \times \text{magnitude of exposure}}{\text{host resistance}} = \% \text{ Cancer risk}$$

Let us assign a value from 1 to 10 for each component where:

- 1 = weakest strength or magnitude
- 10 = greatest strength or magnitude

Increased Cancer Risk

In one scenario the carcinogen is the strongest (10), with the greatest magnitude of exposure (10), and the weakest host resistance (1), thus:

$$\frac{10 \times 10}{1} = 100\% \text{ Cancer risk}$$

Decreased Cancer Risk

In a more favorable risk scenario, suppose we have the strongest carcinogen (10), but the exposure is minimal (1), and the host resistance is strong (10):

$$\frac{10 \times 1}{10} = 1\% \text{ Cancer risk}$$

While we have no control over the strength of the carcinogen, we **do** have control over the magnitude of exposure and to a certain degree control over our host resistance. This is our best hope for preventing cancer.